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Solving Sand Problem in a Steel Foundry

Mechanical Equipment Shakes Out Castings and Prepares
Old and New Sand With Minimum of Labor

—Other Features

BY EDWIN F. CONE

ONE of the most difficult problems in a steel foundry, large or small, is the handling of the sand. Particularly troublesome is the disposition of the old or burnt sand which comes from the flasks after the castings have been poured and shaken out. In some foundries it has been the custom to load this sand into cars and deliver it to dump heaps. Part of it has been screened by hand through large screens, the cleaned sand being used over again as the main portion of the molds. The disposition of the sand as a whole is often an expensive problem.

The Lebanon Steel Foundry, Lebanon, Pa., believes that it has developed and perfected a solution to this problem which fits not only its own conditions but also contributes valuable information to the general problem of molding sand mixtures and the disposition of old sand—both live topics among American foundrymen.

The problem which was faced by the Lebanon company was much the same that confronts similar foundries, except that only small castings are produced. A good facing sand must be mixed and delivered to the molders, and the old sand must be reconditioned to the fullest possible extent before being supplied to the

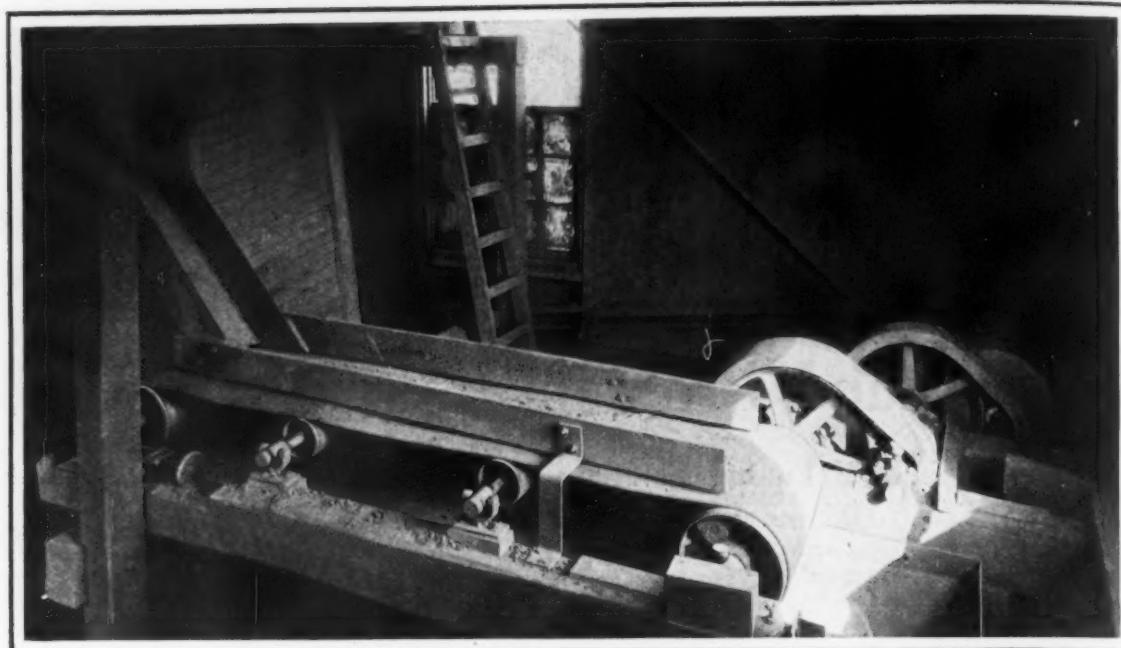
molders. There is also the incidental problem of the shaking out and handling of the castings. The feature of the Lebanon solution is that all of this is being done in a small space by a much smaller number of men than formerly.

Several years' experience with electric furnaces had demonstrated to the satisfaction of the owners of the Lebanon Steel Foundry that a general high standard of foundry molding practice is quite as important as good steel. This, of course, presupposes proper equipment for the mixing of facing and heap sands and their tempering. Study of the problem convinced them that this should be done in one place if possible and as completely by mechanical means as circumstances would permit. This would also eliminate the personal equation which frequently results in non-uniformity of facing and heap sands.

Only small light steel castings are produced by this company. For a given tonnage they cover in their handling a large area of floor space. From the standpoint of economy in operations this prohibits the use of grab buckets and travelling cranes to handle both the sand and the castings as in large foundries. Eventually the following plan was worked out.

The Mechanical Shake-Out Grid and the Method of Transporting Molds, Castings and Sand to Various Parts of the Foundry





The Magnetic Pulley at the Top of the Sand Handling Apparatus. The old sand comes directly from the shake-out grid and all of it flows over this pulley, which separates out all the metal. This falls to the floor below

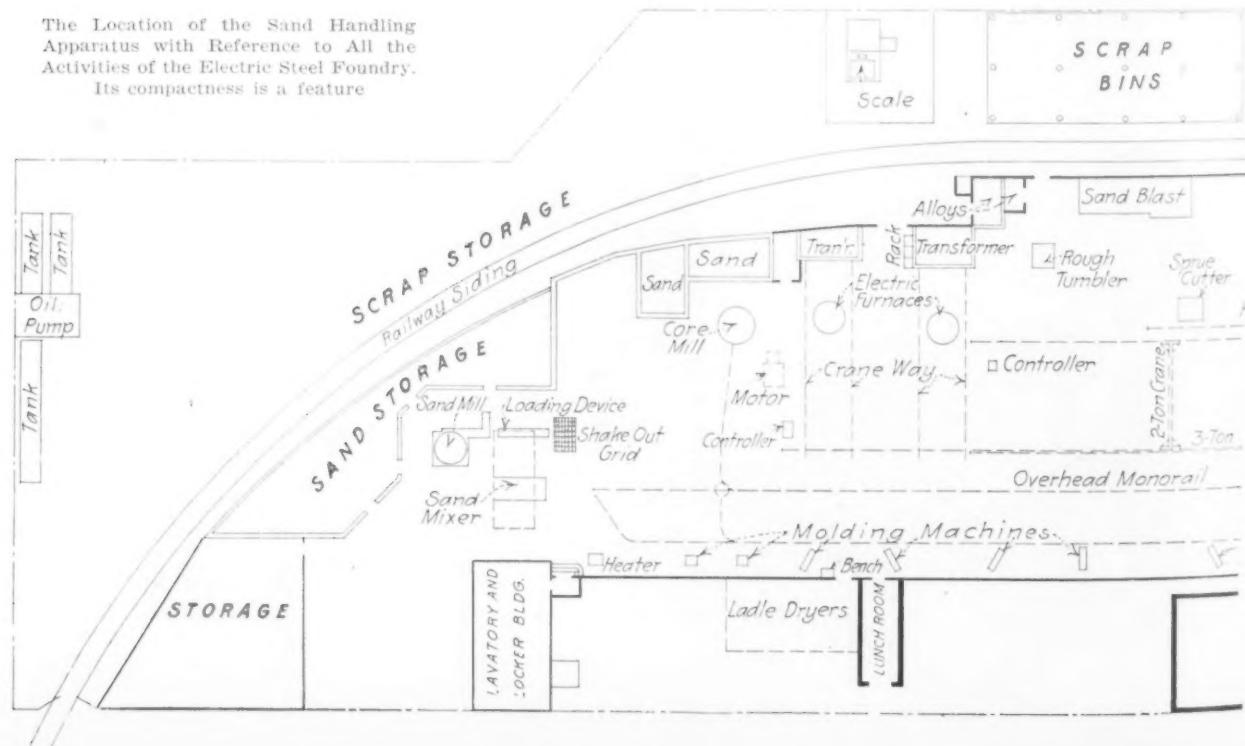
Most of the castings being molded in molding machines at one side of the main building, it was decided that these could just as well be shaken out at the sand-handling center as anywhere else, and that this could be done mechanically better than by hand. The finished molds are placed by the molders on metallic skids, on which they remain while being baked, when necessary, and during pouring. These steel skids are made available wherever needed. They are then taken by means of electric lift trucks to the central shaking out grid or platform, as shown by one of the illustrations, on which they are dumped, flasks and all. This shake-out grid operates like a jolt machine which jars the sand and castings out of the flasks. The castings are then deposited on the skids to be taken by an electric lift truck to the sand blast machines for cleaning. The flasks and bottom boards are put back on the skid

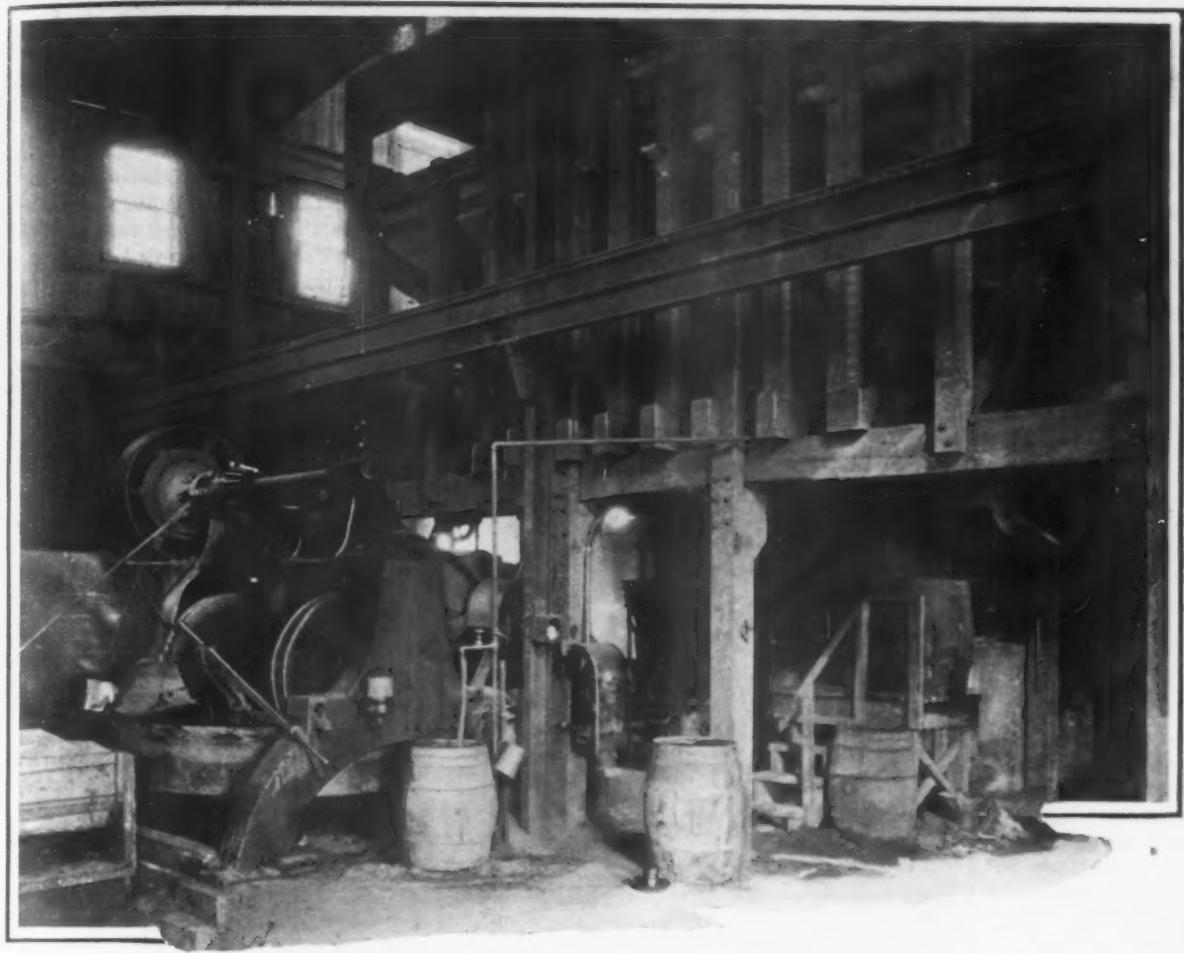
they came down on and are taken back by electric lift trucks to the molder from which they came.

The sand from the flasks and castings falls through the grid into a boat which elevates it mechanically to the top of the building. There it falls upon a belt which passes over a Cutler Hammer magnetic pulley which, as shown by an illustration, removes any shot, scrap, nails, core wire or other ferrous material. The magnetically separated metallic matter falls through a chute to a box on the main floor, where by sorting the useful part is saved. In some foundries the loss from this source is by no means a small item, because of a lack of economical means of separation.

From the belt the sand flows into a revolving screen, which breaks up lumps and delivers into a storage bin. In its travel through this apparatus, the sand has become sufficiently well aerated so that by

The Location of the Sand Handling Apparatus with Reference to All the Activities of the Electric Steel Foundry.
Its compactness is a feature



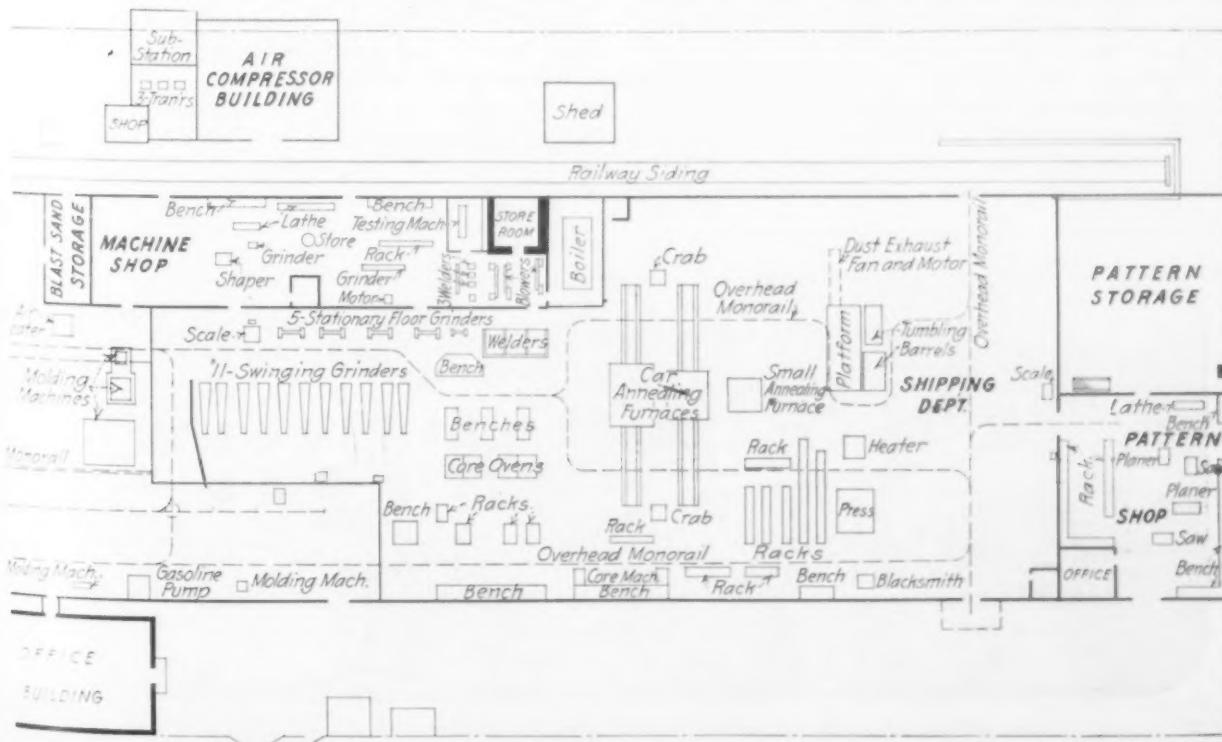


Underneath the Entire Apparatus Are Located the Grinding Mill (Left) for Preparing the Facing Sand and the Mixer (Right) for Tempering the Heap Sand. The old sand falls by gravity from the large bins above into measuring appliances for regulating proportions

the time it drops into the storage bin it is cold and dry. This recovered old sand, thus accumulated in a large bin, constitutes the heap sand and the main portion of the facing sand.

The heap sand needs further treatment or tempering. This is done in a No. 4 Standard Sand &

Machine Co. mixer, located close to the storage bin from which the sand flows by gravity. The facing sand, which of course is largely new sand, is mixed with the proper materials and ground in an American Clay Machinery grinding mill. These ingredients are all mixed dry in a Jaeger concrete mixer, with a



loading device, before they enter the grinding mill to insure absence of dampness when the mixing is completed.

To regulate the proportions of sand used daily there is a measuring device of the company's own design immediately under the sand gate of the storage bin. The prepared heap sand and the properly mixed facing sand are both mechanically loaded into wooden bins or boxes which are placed on the steel skids and delivered to the various molders by the electric lift trucks.

The castings are shaken out and the sand put through all necessary processes in this compact apparatus by means of two electric trucks and six men. The facing and heap sands are also delivered to the molders without any extra labor. To accomplish the same results before this apparatus was perfected, 35 to 40 men were necessary. The efficiency of this apparatus as a whole can be better appreciated when it is realized that the capacity of this electric steel foundry is between 450 and 500 tons monthly of castings averaging less than 20 lb. each. The carrying out of such a scheme presupposes easy

transportation conditions. The entire foundry, the scope of which may be appreciated from the reproduced plan, has a concrete floor in the molding department and a wood block and concrete floor in the cleaning and finishing departments.

Eleven years ago the Lebanon Steel Foundry was incorporated. A little later, on the present site, it was established as a crucible steel foundry with a small capacity. For the first two years it continued to produce crucible castings. In 1914 a one-ton Heroult

electric furnace was purchased, the first one licensed by the United States Steel Corporation. A year later a 2-ton furnace of the same type was installed and two years later an additional 2-ton unit. It may be safely claimed that this company was one of the pioneers in the production of electric steel castings. Since its organization the company has specialized in the manufacture of small castings for motor trucks, automobiles, machine tools and railroad car castings. During the war its entire output was devoted to war material, much of it ordnance and navy work.

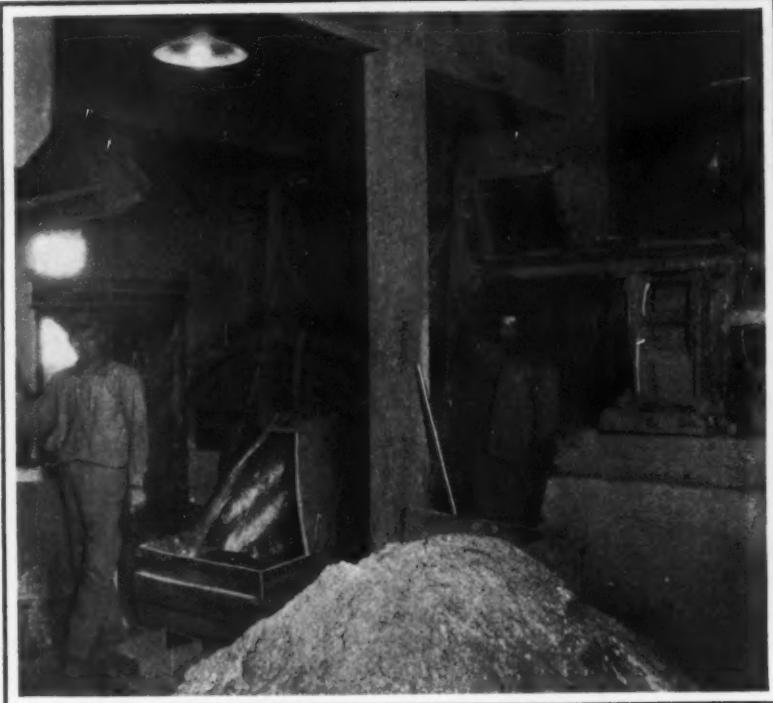
As illustrating the progress of the industry the company states that with increased experience with electric furnace steel, castings are being made of extremely light section — one that would have been considered as beyond the scope of the company's practice only two or three years ago. Many castings used in motor trucks and railroad car construction, which have heretofore been made of malleable iron, are being successfully produced in electric steel.

Mention should be made of the annealing equipment, which consists of three

Mires Fuel

Equipment Co.'s car type annealers, two cars to a furnace. With this equipment, it is possible to subject the castings, all of which are annealed, to any of the three prevailing heat treatments ordinarily given: Cooling down in the closed annealer; cooling in the air from a red heat; double annealing.

The plants of the Whitin Machine Works, textile machinery manufacturers, Whitinsville, Mass., went on a five-day per week schedule on April 1. The company employs about 3500 persons.



The Special Apparatus, Including a Concrete Mixer, Which Is the Starting Point in Mixing the Facing Sand, Which Is Made Up of Old Sand, New Sand and Other Ingredients. This is also under the entire apparatus. The electric truck transports this and the other sand to the molding department



The Present Expanse of the Lebanon Steel Foundry. Eleven years ago as a crucible foundry it occupied only the small building at the extreme left

Steel Direct from Ore by Basset Process

Its Chief Features and Advantages—Critical Discussion of Claims for French Process by a German Engineer —Cost of Plant

A DISCUSSION of the Basset direct reduction process by Fritz Wuest of Düsseldorf appears in *Stahl und Eisen*, Dec. 22, 1921. It gives more information regarding this proposed new French process than has been available up to the present time. First comes a review of the general subject of direct reduction of steel and workable iron from ore. There are not less than 75 German patents on this matter, and the first English patent was taken out by Samuel Lucas in 1792. The more important processes are briefly reviewed, including that of Blair in this country, after which the writer passes to the Basset process.

Lucien Basset, a French engineer, claims to have solved the old problem of making steel direct from ore at the Lavocat cement works at Mantes near Denne-mont, which is in the neighborhood of Paris. According to the French daily paper, *Journee Industrielle*, a



Fig. 1—Sectional Drawing of the Basset Rotary Furnace as Conceived in 1920

company has been organized with a capital of 60,000,000 francs. The inventor receives half these shares and also 275,000 fr. as compensation for his tests. The author critically discusses the Basset process, as made public in the patent papers and contributions to the newspapers. An abstract follows:

Basset uses a rotary kiln and believes that he is the first to use such a furnace for the reduction of iron ore. The furnace used in the tests has a length of 40 to 50 m. (131 ft. 2.7 in. to 164 ft. 0.5 in.) and a diameter of 2.5 m. (8 ft. 2.4 in.). At the lower end where the fuel is burned it is widened in diameter to be suitable for taking up the molten metal and slag (Fig. 1). Powdered coal is used for fuel. The air for combustion is heated in a suitable blast-heating apparatus to 1000 deg. C. At the throat of the furnace finely ground ore is charged together with the necessary limestone and the coal needed for reduction. So far the process presents no surprises. Re-oxidation of the metal is prevented according to the inventor. He professes to be able to burn the powdered coal to carbon monoxide, not to carbon dioxide, whereby re-oxidation of the reduced iron is completely avoided.

The belief of the inventor that he is the first to use the rotary kiln for the production of iron is not correct. In German patent No. 15356, taken out in 1882, an American, G. Duryee, protected a rotary kiln for the production of iron and steel, and the patent shows that this furnace possessed all the characteristics of that of Basset. As may be seen in Fig. 2 it is a rotary kiln with a collecting chamber for the fluid metal and slag near the fuel end. The air for combustion is heated by the outgoing gases, the heating is carried out by producer gas and oil, so that the flame should be as neutral as possible. Operating results are not known. The characteristics of the Basset process, rotary kiln, preheating of the air and neutral flame are already present in the Duryee process.

Dr. Emil Fleischer, in patent No. 157582, Oct. 13, 1903, protected a process in which two rotary kilns are to be used, situated one over the other, for the reduction and melting of the iron. The Eisenwerk Jagstfeld, in German patent No. 282574, Class 18a, Group 3, protected a process by which iron ore is reduced in a rotary kiln and the reduced iron melted in an annexed

shaft furnace. In addition to these three mentioned methods there are many German and other patents which for many years have proposed the use of rotary furnaces. From the foregoing it is clear that the rotary furnace had been proposed long before Basset for the production of iron and steel.

Chief Feature of the Basset Process

The outstanding feature of the Basset process consists in the combustion of the carbon to carbon monoxide instead of carbon dioxide. Further he leaves the hydrogen of the coal unburned. Should the assumption of formation of carbon monoxide exclusively prove correct, then Basset has made a most important discovery. The burning of carbon to carbon monoxide requires high temperature and an excess of carbon. Both these requirements are fully met in the gas producer, but it is nevertheless impossible to make producer gas free from carbon dioxide. With powdered coal firing, the blast serves not only for combustion of the coal but also for dispersion of the coal powder, so that a certain minimum amount of air must be used. The requirements for the formation of carbon monoxide are therefore much more unfavorable than with the gas producer; and from this standpoint, therefore, it is altogether unexpected that the combustion will be carried out in such a way that practically only carbon monoxide is produced.

If, however, it is assumed that this is possible and calculations are made of the theoretical temperature of combustion, the following results are obtained:

With pure carbon: Combustion temperature without preheated air to CO—1325 deg. C., to CO₂—2265 deg. C. Low volatile coal of the following composition: Carbon, 86.22; hydrogen, 3.62; oxygen, 2.48; nitrogen, 1.07; ash, 4.71, and

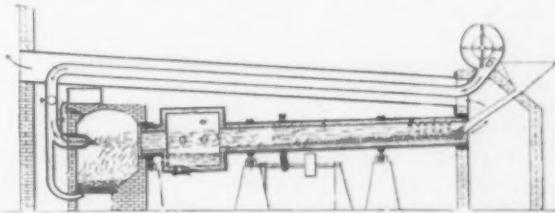


Fig. 2—Sectional Drawing of the Duryee Rotary Furnace as Designed in 1882

moisture, 1.10 per cent. Combustion temperature without preheated air and without combustion of hydrogen, to CO—1210 deg. C.; to CO₂—2100 deg. C. If the air is heated to 1000 deg., the following results are obtained: Pure carbon to CO—2025 deg. C.; to CO₂—2990 deg. C. Above mentioned coal to CO without combustion of hydrogen—1895 deg. C.; to CO with combustion of hydrogen—2195 deg. C.; to CO₂ without combustion of hydrogen—2860 deg. C.; to CO₂ with combustion of hydrogen—2930 deg. C.

From the foregoing figures we can assume that Basset with a good low volatile coal and combustion to carbon monoxide, and hydrogen to water (notwithstanding his assumption) can reach a theoretical combustion temperature of 2195 deg. C. This in no way predicts the actual temperature.

To throw light on this question determinations were made on an open-hearth furnace where the gas composition was known. The gas temperature was 1215 deg. C. and the air 1227 deg. C. This gas gave a theoretical combustion temperature of 2560 deg. C., and the optical pyrometer showed it to be 1710 deg. C. This can be taken as the required theoretical combustion temperature, namely 2560 deg. C.; and a limit of 2500 deg. C. may be assumed as absolutely necessary to melt the produced iron. To produce this tempera-

ture enough carbon must be burned to CO_2 to produce a gas that contains at least 30 per cent CO_2 , because with the carbon burned to CO , and even all the hydrogen burned, only 2195 deg. C. is produced. These calculations show that the Basset supposition regarding his combustion process is not correct, as otherwise the reduced metal in his rotary kiln would not be melted nor a continuous operation be possible.

This gas mixture of three parts CO_2 and seven parts CO will be of great influence on the process in the rotary kiln, and renders impossible the aim of Basset to prevent re-oxidation of the reduced metal. The equilibrium diagram between carbon monoxide, carbon dioxide and ferrous oxide shows that at 1000 deg. C. the CO_2 amounts to only 23 per cent. At 1600 deg. C. this drops to 6 per cent. In our gas mixture the CO_2 is 30 per cent and it is clear re-oxidation would take place and lead to loss.

If the sponge contains carbon a part of this oxidized material will be again reduced on melting, but the amount will only be noticeable if every pure ore is used. If the ore contains much gangue the silica slags with the ferrous oxide and the loss will be very great. The carbon of the metal produced will depend on the amount of re-oxidation of the iron, the composition of the slag and the temperature in the collecting chamber. Only with very high temperature and the use of pure low silica ore will it be possible to produce soft steel. If ores high in silica are used a steel-like product will be the result, between steel and pig iron, that must be refined in a second process. This will be the case under all conditions if ores high in phosphorus are used because considerable phosphorus will be taken up by the metal.

Advantages of Basset Process

According to the assertions in the daily newspapers, the correctness of which will bear investigation, the process offers the following advantages:

1. The coal consumption per metric ton of steel should amount to only 500 kilos (1120 lb. per gross ton).
2. Labor costs should be reduced 75 per cent.
3. Plant cost should be 80 per cent less.
4. The cost of production should be 50 per cent less.

These assertions are taken up in order and carefully discussed. In Table I is given a balance of materials for the Basset process under the most favorable possible conditions, namely, under the assumption that with direct reduction carbon monoxide alone is produced. The analyses of the materials used is as follows: Rio Tinto Ore: Fe_2O_3 , 87.80; MnO , 0.13; CaO , 0.30; MgO , 0.20; SiO_2 , 6.60; S , 0.33; P_2O_5 , 0.13; CuO , 0.31; PbO , 0.55 and H_2O , 3.65 per cent. Limestone: Fe_2O_3 , 1.00; Al_2O_3 , 0.60; MgO , 0.50; SiO_2 , 1.40; CaO , 53.50, and CO_2 , 42.90 per cent. Coal: This analysis is the low volatile coal mentioned before with C 86.22 per cent, etc. Analysis of the coal ash showed SiO_2 , 52.00; Al_2O_3 , 16.00; CaO , 10.00; Fe_2O_3 , 22.00 per cent.

Table I—Balance of Materials, Basset Process

	Oxygen of			
	Iron as Fe_2O_3	CO_2 in Water in	Fe_2O_3 in Ore, Stone, Charge,	
	Kg.	Kg.	Kg.	Kg.
Rio Tinto ore	1.620	1.000	0.428	0.059
Limestone	0.175			0.0735
Coal ash	0.017			
Total	1.812			
Coal for reducing	0.372			0.005
For heating	0.510			
Total	0.882	1.000	0.428	0.0735 0.064

The amount of slag is 1.812 minus $(1.000 + 0.428 + 0.0735 + 0.064) = 0.246$ Kg. The slag figured as a bisilicate. From this balance sheet it is seen that for heating the rotary kiln 510 kg. of coal per metric ton of steel are needed. This agrees with the figure of 500 kg. given in the newspapers but it must be remembered that for reducing the metal 372 kg are also needed, giving a total coal consumption of 882 kg. per metric ton (1975 lb. per gross ton).

In Table II is given a heat balance based on the figures of Table I and the assumption that the rotary kiln has an efficiency of about 60 per cent, a figure that is certainly extremely favorable when it is re-

membered that the open-hearth has an efficiency of only about 30 per cent.

Table II—Heat Balance of the Basset Process
(Based on a theoretical combustion temperature of 2,900 deg. C. and a loss of heat through radiation and conduction of 40 per cent.)

	Units, Per	Units, Per
Incoming Heat Cent		
1. Oxidation of 0.372 kg. reduction coal to CO	775	17.1
2. Combustion of 70 per cent of the heating coal (0.357 kg.) to CO_2	745	16.5
3. Combustion of 30 per cent of the heating coal 0.153 kg. to CO_2	1,065	23.5
4. Combustion of hydrogen of the heating coal 0.0169 kg. to water	490	10.1
5. Combustion of hydrogen of the reducing coal 0.0123 kg. to water	357	7.9
6. Combustion of the total sulphur, 0.007 kg. to SO_2	15	0.4
7. Heat content of the necessary air for combustion, 3.342 cu. m. pre-heated to 1000 deg. C.	1,109	24.5
	4,556	100.0
Outgoing Heat Cent		
1. Heat consumed in reduction of 1,000 kg. iron, 1,758	38.6	
2. Heat content of 1,000 kg. iron at 1600 deg. C. 311	6.9	
3. Heat content of 0.246 kg. slag 123	2.7	
4. Heat consumed in expelling 0.0735 kg. CO_2 from limestone 72	1.6	
5. Heat consumed in vaporizing 0.064 kg. water 43	0.9	
6. Heat lost with the 4,553 cu. m. waste gases at 300 deg. C. 451	9.9	
7. Heat lost through radiation and conduction	1,779	39.4
	4,556	100.0

From this heat balance it is seen that 4556 heat units are needed for the reduction of 1 kg. iron, although pure ore was taken; while the results of Gillhausen, (*Metallurgie*, Vol. 7, p. 421) with the blast furnace, have shown that 3506 heat units are needed. This shows that the Basset process is less economical than that of the blast furnace due to the fact that reduction is brought about by solid carbon, while in the blast furnace about two-thirds is the result of reduction by carbon monoxide. Table III gives a comparison of the waste gas situation of the Basset process and the blast furnace, the latter being based on Gillhausen's tests.

Table III—Waste Gas Practice

Calculated on 1000 Kg. Iron	Basset	Blast
Amount of gas (cu. m.)	4,107	3,478
	CO_2 , 7.0	CO_2 , 12.5
	CO , 28.5	CO , 27.0
Composition, per cent	N, 64.5	CH_4 , 0.75
		H, 1.65
		N, 57.8
Heating value	865	925
Theoretical combustion temperature, deg. C.	1,450	1,490
Amount of blast cu. m. per 1000 kg. iron, 0 deg. C. and 760 m.m. pressure.	3,342	2,535
Loss cu. m. through reversals, etc., 30 per cent	1,003	761
Daily blast requirements cu. m., 0 deg. C. and 760 m.m.	4,345	3,296
Blast temperature entering furnace, deg. C.	1,000	730
Blast temperature leaving stoves, deg. C.	1,100	820
Heat consumed in heating blast (heat units)	1,596,250	\$86,000
With 75 per cent stove efficiency	2,128,330	1,180,000
Waste gas consumed in heating blast (cu. m.)	2,460	1,290
Consumption of waste gas of total amount, per cent	60	37
Total gas lost in the mains, per cent	10	10
Necessary for the operation, per cent	7	18
Available, per cent	23	35
Available in cu. m.	950	1,200
Available in heat units	821,750	1,130,000
Available in hp. hours, assuming 3000 heat units per hp. hour	244	376
Available hp. for each metric ton produced in 24 hr.	11.4	15.6

From Table III it is seen that the Basset process is not economical regarding waste gases compared with the blast furnace. The available horse power-hours for each ton of iron produced in 24 hr. is 15.6 for the blast furnace while it is only 11.4 for the Basset process.

The next claim is regarding labor costs, and for comparison the blast furnace and basic Bessemer plants are combined, and it may be mentioned that the

cost figures are taken from a large plant in Westphalia and based on the gold mark:

Old practice:	
Blast furnace labor costs per ton pig iron.....	2.40
Basic Bessemer per ton steel.....	3.00
 Total marks	5.40
Basset process:	
Rotary kiln plant requiring 12 men each shift at 6 marks	72.00
Wages per ton steel with production of 12½ tons each shift	5.76

From this comparison it is seen that the labor costs with the Basset process are somewhat higher than with the old methods, so that the statements in the daily papers cannot be agreed with.

Cost of Plant

The next point is the cost of plant. A blast furnace plant in the Rhine-Westphalia district, producing 330,000 metric tons pig iron yearly, costs 12,000,000 marks excluding the cost of the ground. The steel plant to work this iron requires a further cost of 2,000,000 marks. A rotary kiln plant in a plant in the same district to agglomerate flue dust costs 320,000 marks. From these figures the following comparison can be drawn:

Old plant:	
Blast furnace (330,000 tons year), 12,000,000 marks. Per year ton.....	36.40
Basic Bessemer (290,000 tons year), 2,000,000 marks. Per year ton.....	7.00
 Total	43.40
New plant (Basset):	
Rotary kiln to handle flue dust.....	320,000 marks
To this add blast stoves, gas cleaners, drying and grinding for the coal and the melting chamber	100,000 marks
 Total	420,000 marks
Yearly output, 25 × 300.....	7,500 tons
Plant cost per year ton.....	56 marks

The results show an advantage in favor of the old practice of 12.60 marks per ton per year, and it is assumed that Basset can make finished steel in his plant, which is not yet established. The assertion in the papers that 80 per cent of the plant cost would be saved is therefore shown to be incorrect. The blast furnace with its stoves produces each hour and cubic meter 21 kg. pig iron. With the Basset process only 4 kg. iron would be produced. Five rotary furnaces would be needed to give the same tonnage as a blast furnace of equal interior capacity.

The last item remaining is cost of production, and on the basis of the material balance sheet the following comparison is worked out:

Old process:	
Liquid steel per metric ton.....	65 marks
New process:	
1620 kg. ore at 16 m. per ton.....	25.92
882 kg. coal, ground and dried, at 20 m. per ton	17.64
Limestone	0.50
Wages	5.76
Interest	2.80
Precipitation	5.60

Total 58.22 marks
The amount in favor of the new process is 6.78 marks per ton. This comparison favors the new process, but the figures of daily production which affect 50 per cent of the cost cannot be agreed with.

It must be remembered that Basset can only produce finished steel in his furnace if he commences with very pure ore. Usually a product between steel and pig iron will be the result, which must be further refined, whereby the cost of production will be increased, and the new process will not be advantageous compared with the old process.

As a conclusion the Basset process cannot be carried out without a part of the reduced iron being slagged, and his process is not better than former direct processes regarding complete utilization of the ore. The statements in the daily papers regarding saving in labor costs, production costs and plant cost are not substantiated on examination.

G. B. W.

The Sanford Riley Stoker Co., Worcester, Mass., manufacturer of automatic stokers for power boilers, reports more business for the first three months of the present year than it received during the whole 12 months of 1921.

RECONSTRUCTION HOSPITAL

Restoration of Men After Accidents in Industries an Important Feature

As a direct result of the world-wide experiments in rehabilitation of men injured in war, America has now a hospital dedicated solely to the care of industrial diseases and accidents and the restoration of industrial casualties to active useful life again. The Reconstruction Hospital, with the breaking ground Sunday, April 2, for its new 11-story addition at 100th Street and Central Park West, New York, now enters upon a national career, prepared to offer a unique service to industry.

The beginning of the new building marks the end of the first year at the present location, during which time the hospital's space and facilities have been taxed to their utmost. It is a new idea to have a hospital where men suffering from any of the many casualties of industry may receive the benefits of an intensive study of their cases by surgeons specializing in all the newest forms of therapy, combined with the complete after-care of the patient until he is fit to earn a livelihood. Yet, in the brief life of the present hospital, men have been sent from all over the country to take advantage of its unusual treatment, and many suffering from seemingly incurable physical ailments and distortions have been returned to useful industrial life again.

The addition to this new style hospital will be of limestone and brick. It will have besides the usual equipment of a modern hospital the most extensive and complete physio-therapy plant in existence. There will be rooms for occupation therapy, especially designed equipment embodying the latest principles in rehabilitation, electro-therapy, and mechanical apparatus, whirlpool baths, so successfully developed by the military surgeons during the war, and a gymnasium where a score of mechanical devices assist the patient in recovering the fullest use of stiffened joints and weakened muscles.

The plans provide for space for 175 beds in small wards and semi-private rooms where women and children may be treated as well as men, and recreation and reception rooms for the older patients. There will be a radiophone to help in keeping the patients' mind toned upward as well as their bodies.

The total cost of the new annex will be \$1,500,000. It is hoped to complete the first two stories at once to relieve the pressure on the present hospital in which an average of 175 cases receive treatment daily, half of that number being sent by the Government.

An interesting feature of the ground-breaking ceremony was the participation of two men who were patients in the hospital a year ago. At that time one of them was totally paralyzed below the waist as the result of a fall and the other was unable to use his arms. Both have since been restored completely and were chosen to represent the hundreds of other men who, crippled through accidents in industries, have been restored and sent back to fields of productivity.

C. L. Lingo, traffic manager Inland Steel Co., Chicago, acting on behalf of his own company, the Acme Steel Goods Co., the Interstate Iron & Steel Co., the Keystone Steel & Wire Co., the Illinois Manufacturers' Association and the Chicago Association of Commerce, has filed a brief with the Interstate Commerce Commission relative to the application of certain railroads who are asking authority to establish a blanket rate on iron and steel commodities of \$1 per 100 lb. from all points in transcontinental groups A to J on shipments destined to Pacific Coast terminals, with higher rates to intermediate points. The brief opposes a blanket rate covering the various points of origin and insists that shipments of iron and steel articles from Chicago to Pacific Coast terminals for domestic consumption should be transported at rates at least 10c. lower than those applying on the same commodities from Pittsburgh and points taking the same rates to the same destinations.

Planer Arranged for High Speed

The accompanying illustrations show a 26 in. by 32 in. by 18 ft. planer of the Whitcomb-Blaisdell Machine Tool Co., Worcester, in which the feature is the high cutting speeds attained. The machine operates at 150 ft. per min. on both cutting and return strokes.

The unusual speed attained is pointed out as demonstrating the advantages of the Whitcomb second-belt drive, the construction of which may be seen in the accompanying phantom view. In the other illustration the machine is shown operating on composition-brass



screen plates approximately 13 by 30 in. in size, which are held two abreast in a special quick-acting fixture.

Deviations from standard construction include two single heads on a double cross-rail, both heads running on the lower screw. The bed is cast in one section and the table has T slots but no holes. The distance between the tools is about 12 in. A steel rack runs the full length of the table. Thirty inch driving pulley and shipper motion are provided.

Plan to Change Shipyard to Pipe Plant

SEATTLE, April 3.—The Western Steel & Pipe Co., San Francisco, has taken an option of purchase on the Patterson-McDonald shipyard, built during the war to construct wooden ships, and it is announced will establish a steel and iron pipe manufacturing plant on the property. The purchase price is given at \$140,000. Robert D. Plageman, sales manager, conducted the trade for the Western company.

Plageman says that his company expects to secure the contract for the manufacture of 17 miles of 66-in. by 5/16 in. piping for the municipal Cedar River water project for which the San Francisco company was the lowest bidder. In the event of securing this contract the work of converting the shipyard into a pipe factory will begin this week, Mr. Plageman said. A total of 200 men will be employed. In entering the North Coast pipe field, he said it was the intention of the company to establish here a plant of sufficient capacity to take care of requirements in Washington, Oregon, Idaho, Montana and Alaska.

There is some local controversy over the kind of pipe to be used for the water project, lumber interests demanding that it be of wood staves. Grant Smith & Co., contractors of Seattle, bid \$1,467,911, covering both the cost of the pipe and installation. The controversy will be decided by the board of public works at its Friday meeting this week. Grant Smith & Co. submitted another bid for \$1,468,602 for riveted steel pipe, promising to fabricate the material here.

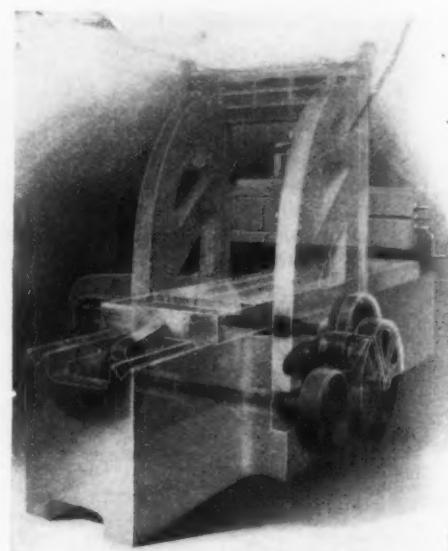
The steamship Mongolian Prince arrived at Van-

couver, B. C., from Wales with 2500 tons of tin plate which will be used in the manufacture of cans for the salmon canneries of British Columbia this year.

Gear Makers' Meeting in Buffalo

The sixth annual meeting of the American Gear Manufacturers Association will be held April 20, 21 and 22 at the Lafayette Hotel, Buffalo. This association, through a sectional committee, has been working in close co-operation with the American Engineering

Planer Arranged to Operate at 150 Ft. Per Min. on Both Cutting and Return Strokes. View to left shows mounting of work, the phantom view at the right showing arrangement of second belt drive



Standards Committee, and the report of this and other committees on standardization promises to be of unusual interest.

Special emphasis will be given to business conditions in the gear industry and the outlook for the immediate future. Among the subjects to be discussed are "Good Hob Practice," by H. E. Harris, H. E. Harris Engineering Co.; "The Use of the Projector Comparator in Testing Gear Teeth," by Ralph E. Flanders, Jones & Lamson Machine Co.; "Proportions of Industrial Gears," by G. E. Katzenmeyer, R. D. Nuttall Co.; "The Grinding of Gear Teeth and Its Future in the Industry," by R. S. Dummond, Gear Grinding Machine Co.; "The Gleason Works System of Bevel Gears," by F. E. McMullen and T. M. Durkan, Gleason Works, and "Conditions in the Industry," discussed from the standpoint of the industrial member companies under the leadership of George L. Markland, Jr., Philadelphia Gear Works, and from the automotive standpoint with R. P. Johnson, the Warner Gear Co.

An informal banquet for representatives and guests will be held on Friday evening, April 21, the principal speaker being John C. Bradley, Pratt & Letchworth Co., Buffalo, whose subject is "What's Ahead." During the meeting four members will be elected to serve on the executive committee for a term of three years.

The Richmond Iron Works, Richmond Furnace, Mass., charcoal pig iron, because of its large stock of ore above ground, has discontinued mine pumping operations in the interest of economy. The company produces a high grade and high cost pig iron used extensively in the production of rolls for steel mills and other special products. The company's furnace has been out of blast several months due to business conditions and to the fact it has sufficient iron stocked to supply orders. It will not be a serious matter to unwater its mine and resume operations when business conditions warrant. Samuel G. Colt, president and treasurer, states the company is in a position to start making pig iron on two weeks' notice. The furnace has been relined and put in first class condition.

The eighth annual convention of the American Association of Engineers will be held at Salt Lake City, Utah, on June 5, 6 and 7.

Development of Continuous Rolling Mills

Wire Rod Mills of Two Types Took Form Simultaneously Belgian or Looping Mill Compared With Continuous —Mills for Skelp and Strip Steel

BY JOHN W. SHEPERDSON*

(Continued from page 794, THE IRON AGE, March 23)

WHILE billet and sheet-bar mills are the first continuous mills to work upon the steel, after the cast ingot commences to undergo mechanical treatment, the rod mill was the first of the continuous mill family to be put into operation—not because wire rod presents the easiest continuous rolling problem, but because it was in its production that conditions were first found which justified a specialty mill. These conditions were a large demand for a single size and section, and a premium on length. George Bedson showed great courage in putting into practice such an advanced form of rolling on such a difficult product.

Any discussion of rod rolling almost necessarily involves a comparison of two mills which took form almost simultaneously. These are the continuous mill

ing mill into three trains, so that there might be more points of loop control than obtained in two-train construction.

Continuous rolling is usually regarded as a process in which the rolls are arranged in tandem, and the steel passes from one pair of rolls to another through a short intervening space. The reductions are performed simultaneously by the several pairs of rolls, each successive pair driven at an increasing speed to care for the elongation. This should be termed "straight continuous rolling" and should not be granted the general definition of "continuous rolling." Continuous rolling, in its broadest sense, is that form of rolling in which the material in the process of reduction, passes but once through each pair of rolls, and where the speeds of the rolls are so related that they

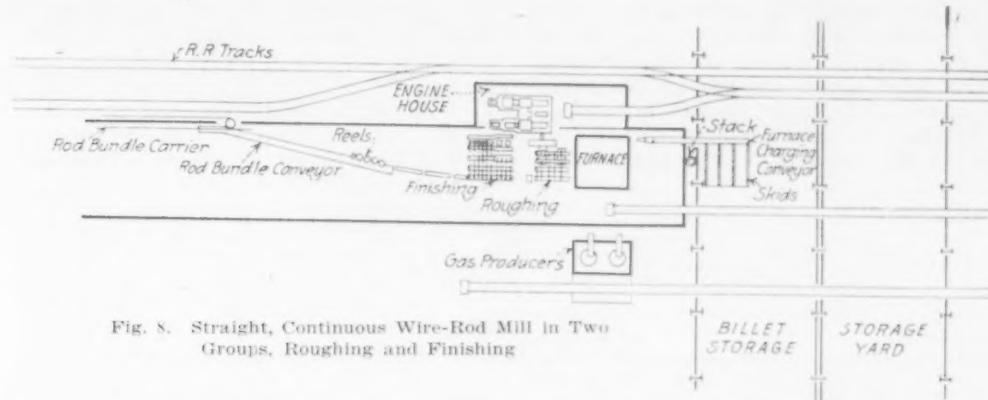


Fig. 8. Straight, Continuous Wire-Rod Mill in Two Groups, Roughing and Finishing

and the Belgian, or looping, mill, both of which are in use to-day.

The continuous rod mill has changed but little in principle since its inception. The improvements made in it have been largely in details and in the collateral auxiliaries, such as heating furnaces, shears for cropping in process, and equipment for coiling, cooling, and disposing of the finished rod. In the looping mill, on the other hand, there have been a gradual evolution and a decided tendency to approach continuous rolling.

The looping mill had, in early form, an 18-in. or 16-in. three-high, hand roughing stand, which reduced a 4 x 4-in. billet to a square of approximately 1 3/16 in. This square was next passed three times through an intermediate roughing mill, running at higher speed. Then the material passed to a finishing mill arranged in two trains, each having four pairs of rolls, and each train driven at a different speed. The rolls in each train were progressively increased in diameter, to reduce the extent of the loops. The loop between the two groups was of course under full control, and did not grow appreciably, but between stands in the same group the growth of the loop to large dimensions could be controlled only slightly by manipulating the roll diameters. This increase in roll diameters, moreover, gave a poorly lined up transmission.

Disregarding the auxiliary equipment and confining our attention to changes affecting the rolling process, the first significant improvement in the looping mill was borrowed from contemporary merchant-mill practice. The three-high roughing stands were abandoned in favor of a continuous roughing train. The next significant change was the division of the finish-

are proportional to the elongation taking place. Under this definition, the rolls need not be arranged in tandem, but may be so placed that a loop is formed. If this definition is accepted, then, in justice to the continuous principle of rolling, it must be said that the looping mills, by the splitting up of the trains into smaller groups whose speeds are adjusted for loop control, are constantly approaching the continuous mill in principle.

In justice to the looping mill, on the other hand, it must be said that recent continuous rod mills have been divided into groups with intervening 180-deg. loops, to secure some of the freedom and flexibility which the looping mills possess. The continuous principle, however, is preserved, because the speed relation between groups is maintained for full control of loops.

The inevitable result of long loops in Belgian mills, together with their necessarily slower finishing speed, governed by the limit of manual skill, is serious loss of temperature. This loss of temperature is reflected in higher power consumption, to the extent of about 35 per cent. Finishing temperatures can be kept within reasonable bounds only by rolling small bundles in which, since crop losses are the same per bundle, the yield is from 1.5 to 2 per cent, smaller than with 300-lb. bundles.

This reference to looping mills has been made for purposes of comparison—not because these mills are a part of the subject matter of this paper, but because both forms of rolling are practised, and undoubtedly both are of interest in discussing rod rolling.

Continuous Rod Mills

The straight continuous rod mill shown in Fig. 8 has been brought to a high state of development by advanced details of construction and the introduction

*Engineer, Morgan Construction Co., Worcester, Mass. The paper was read before the Engineers' Society of Western Pennsylvania.

of very efficient auxiliaries. It usually consists of 16 stands of two-high rolls, divided into two groups. The first group consists of six stands of rolls, the first pair located immediately in front of the furnace. The furnace, of the side-discharge type, feeds uniformly heated 30-ft. billets, 1.75 in. square, to the first stand; and the entire installation is so compact that when the product begins to come onto the reels, two-thirds of the billet is still in the furnace being heated.

Consisting of 10 stands of rolls, the second group is

of the roller easier and gives him additional freedom and flexibility. The continuous finishing mill is broken up into three groups, connected by 180-deg. repeaters. The groups are separately driven at correct speeds, to prevent almost completely the growth of the loops after they are formed. The exposure of the steel on the looping floor is extremely short, and is uniform for each unit of length of the rod, so that there is no difference in temperature between the first and last end of the rod in the finishing pass. This form of continuous rod

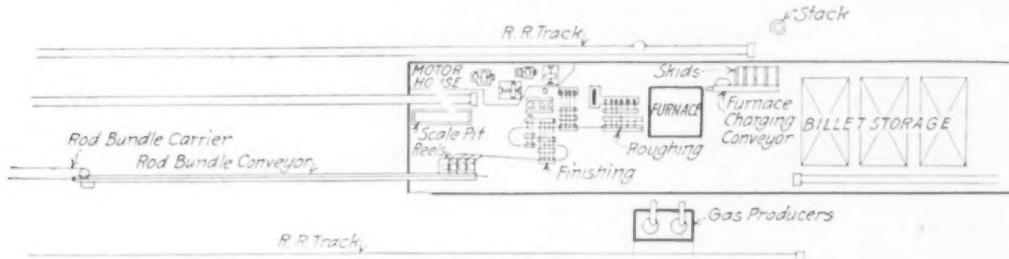


Fig. 9. Continuous Finishing Trains Arranged in Three Groups, Following a Roughing Train of Six Stands

separated from the first group by a space of about 20 ft., in which a flying shear is installed. This flying shear crops the front end of each bar as it issues from No. 6 stand, so that a clean end is presented to the finishing mill, where the high-speed rolling begins. An additional function of the gap between the two groups of mills is to provide a space where a little slack can be formed. This insures absence of tension in the material at this point, and makes possible the adjustment of the passes of the finishing mill, without corresponding adjustment of the roughing mill.

To secure the best results, the roll passes in the

mill has reduced the fin at the back end of the rod bundle to between 24 and 18 in.

A continuous rod mill of this type gives a monthly production of slightly over 10,000 gross tons of No. 5 rod, with a yield of 97 to 97.5 per cent, a fuel consumption of 127 lb. of coal, and a power consumption of 90 kwhr. per ton of output.

Mills for Rolling Flat Finished Products

Under this classification come skelp, strip, hoop and cotton-tie mills. Since the same problems are involved in each case, these mills may be treated as a single

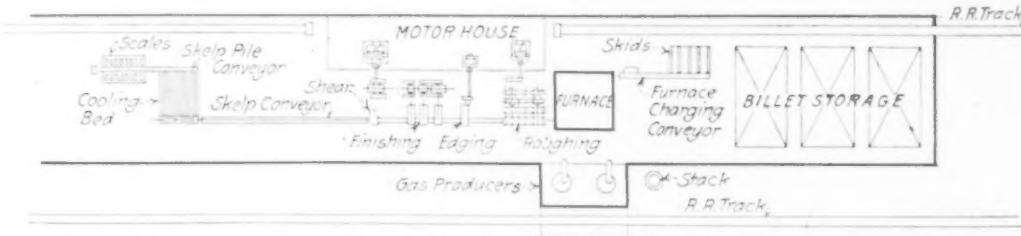


Fig. 10. Continuous Skelp Mill in Three Sets: Roughing, Edging and Finishing

finishing mill require accurate turning and skillful adjustment. If excessive tension develops at any point in the mill, finned ends will result. The factors in this equation, under control of the operating crew, are the accurate turning of the grooves and the proper choice of roll diameters for the various stands. It is surprising, in view of the precision required, what good rods the straight continuous mill is producing, and how skillful the rollers have become in detecting the smallest irregularities.

The skill of the roller and his crew is a large fac-

subject. The rolls of such mills are, with few exceptions, of plain cylindrical form without grooving. The use of such rolls affords a maximum of flexibility in producing flats of a variety of widths. The width of the rolled product is controlled by vertical edging rolls; therefore, tongue and groove passes are not necessary.

The use of vertical rolls, with center which can be adjusted, avoids the difficulties encountered in continuous trains in edging flats in horizontal rolls with fixed centers. The delivery speed of an edging roll is substantially the speed at the bottom of the groove.

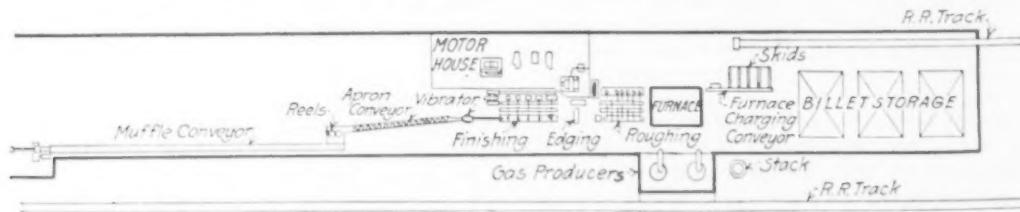


Fig. 11. Continuous Hoop Mill with Vibrator and Apron Conveyor Leading to the Reels

tor in the successful operation of straight continuous rod mills. If we stop to consider that two strands of rod are rolled simultaneously, with all that this implies in the way of delicate adjustment of rolls and guides, and that the finishing speed is 3200 ft. a minute, it will be clear that in the rod-mill crew there is opportunity for team work of the high order of major league baseball.

Recent installations of continuous rod mills have taken a form, shown in Fig. 9, which makes the work

of varying depth for the varying widths, and obviously there is no common delivery speed for all widths of flats to which drafts can be related. As a consequence, the draft becomes absurdly light for wide flats, and impossibly heavy for narrow flats. This is entirely avoided when, with a fixed groove depth, the centers of vertical rolls can be adjusted for the variation in the width of flats.

Billets for conversion into flat products in con-

tinuous mills are usually of slab section, the width varying to suit the product. The thickness of the slabs is maintained around 1.75 and 2 in. When narrow flats are to be produced, 1.75 and 2-in. square billets are used; and for the very narrowest flats, such as cotton-tie and hoop, these billets are reduced to smaller squares in grooved passes before the flattening process begins.

The roll stands of continuous flat mills are arranged in straight continuity, and are divided into roughing, intermediate, and finishing mills, each driven by a separate motor. The advent of adjustable-speed motors having a wide range of speeds has permitted a degree of flexibility that is highly desirable in flat rolling. Vertical looping is induced immediately after the bar leaves the roughing rolls. In this way, the necessary freedom to obtain accurate sections from end to end is secured. In all cases, the first stand of the roughing mill is placed immediately adjacent to the discharge door of the heating furnace, so that the temperature of the entire rolled length may be maintained uniform.

Flat mills differ from one another chiefly in their size, the total number of stands, and in the disposal of the product. The principles involved are identical for all their products. Two types are illustrated in Figs. 10 and 11.

Skelp must be cut into lengths not exceeding 22 ft.; consequently, skelp, after it leaves the finishing rolls, passes through an automatic flying shear which cuts it into the desired lengths. These lengths are collected mechanically into piles on the cooling bed, which piles,

each representing the product of one or two billets, are advanced across the bed to the bundlers and weight scales. A 10-in. skelp mill, consisting of eight pairs of horizontal rolls and two pairs of vertical rolls, one pair driven by an independent motor, produces skelp from 1% in. up to 8 in. wide, and makes from 12,000 to 14,000 tons of finished product per month.

Strip steel, hoop and cotton-tie are customarily finished in coils. These coils are formed on ribbon reels, two of which are usually sufficient to receive the product of a mill. After leaving the last stand of rolls, the material passes through a vibrator. This is a machine which lays the finished flat in a serpentine form upon a slowly advancing conveyor, where it stands on edge until its front end is picked up and entered into one of the reels by hand. The reel runs at a considerably greater speed than the mill, so that there is ample time for starting, coiling and discharging the bundle before the next strip is due.

Straight continuous rolling at high speed brings the steel to the finishing pass hot, with the result that thin gages can be produced. Each unit length of billet starts at the same temperature and undergoes each reduction at exactly the same period in the rolling cycle. Because of these conditions, the finished piece is of absolutely uniform gage and temper from end to end. These conditions are in striking contrast to those which obtain in hand strip mills, the product of which necessarily varies in gage, due to the varying amount of exposure to cooling influences.

(To be concluded)

Electric Power in the Steel Industry

Under the above title, W. S. Hall, electrical engineer Illinois Steel Co., Chicago, has read a paper before the Association of Iron & Steel Electrical Engineers bringing out a number of important points which are summarized below. Among other things, he shows that the electric load in a great many plants is carried to-day almost entirely on the use of fuel, in one form or another, which was formerly wasted. That is, the steel plant station gets for its use what is left of the fuel after the iron and steel making processes get through with it.

The first waste fuel made available in the manufacture of iron and steel is the gas produced in converting coal into coke. If the coke ovens are not located in the plant where the coke is used, or at least nearby, this gas is not available, on account of the transmission distances involved. If the coke plant is so located that the coke-oven gas is available, its most ready use is found in the making and reheating of steel. Any surplus after such demands are taken care of can then be used as fuel for electric power production.

The next step in the process of the manufacture of iron and steel, from which waste fuel is derived, is blast furnace operation. A modern 600-ton blast furnace uses approximately 560 tons of coke each 24 hr. In the production of 600 tons of iron approximately 70 million cu. ft. of gas are produced. This is equivalent, at the rate of 90 Btu. per cu. ft. to about 6 billion Btu., or approximately 250 million Btu. per hr.

The next largest source of waste fuel is the steel making furnace. In the ordinary open-hearth furnace operating on producer gas, the stack temperatures run from 1100 deg. to 1400 deg., depending somewhat upon the practice. Gases at these temperatures, when allowed to go free to the atmosphere, represent a considerable energy loss. It has now become common practice to pass these gases through waste heat boilers.

With these boilers operating in connection with an open-hearth furnace, the temperature of the gas entering the boilers, is say, 1400 deg., and as it leaves the stack may be about 550 deg., without economizers. This difference in temperature represents the heat given off to the boiler to produce steam. A 75-ton open-hearth furnace with a properly designed boiler will produce in ordinary practice about 350 boiler hp. At a boiler efficiency of 75 per cent, the coal equivalent to the steam produced on a 75-ton furnace waste heat boiler installation is about 18 to 20 net tons per day.

In the discussion, Gordon Fox, consulting engineer Freyn, Brassert & Co., Chicago, pointed out that a 600-ton blast furnace produces about 55,000 cu. ft. per min. of gas during the periods that it is in blast. About six times a day it is necessary to tap the furnace to get the iron out of it; during that period the blast is taken off and the gas made is about 3000 cu. ft. per min. instead of 55,000; consequently, during that period there is very little gas available for use under boilers.

In a plant having ten or a dozen blast furnaces the diversity factor comes into play, and one furnace off for casting makes little difference; but with only one or two furnaces, those periods of casting are important, because they cut off a very considerable proportion of the gas supply. [The method of using a gas holder, as at Sparrows Point, to equalize gas quantity and pressure, was not mentioned. Editor.]

In an open-hearth plant utilizing waste heat in boilers, there is a condition somewhat analogous, but not so serious. It is necessary to tap an open-hearth furnace at intervals and charge it, and during that time there is practically no waste heat available, so that during those periods of perhaps half an hour, that particular open-hearth furnace is not delivering any waste heat.

A gasoline motor railway coach, designed and built by the Service Motor Truck Co., Wabash, Ind., arrived at Indianapolis on a trial trip over the Lake Erie & Western, March 29. It made the trip from Peru to Indianapolis in two hours and a half, 13 minutes less than train time. The coach is 44 ft. long, has a seating capacity for 46 persons and 70 ft. of space for baggage. It uses a gallon of gas every 5½ miles.

The contract for the construction of the Norway dam on the Tippecanoe River, near Monticello, Ind., has been awarded to the Mansfield Engineering Co., Indianapolis, at approximately \$500,000, not including machinery and equipment. The dam will be the basis of one of the largest electric power projects in Indiana.

How much advantage is being taken of the wireless telephone is indicated by plans for Dexter S. Kimball, president of the American Society of Mechanical Engineers, to broadcast a message from the General Electric Co.'s high-power station at Schenectady, N. Y., on the evening of April 4, at 8.30 p. m., Eastern standard time.

Crane for Serving Vertical Gap Riveter

An electric overhead crane for handling tank and pipe sections, serving vertical gap riveting machines, has been developed by the Pittsburgh Crane & Equipment Co., Pittsburgh. It has been found to expedite the manufacture of tanks and steel pipes to a marked degree over the usual method of portable pneumatic riveting, better quality of work and fewer defective rivets being also claimed.

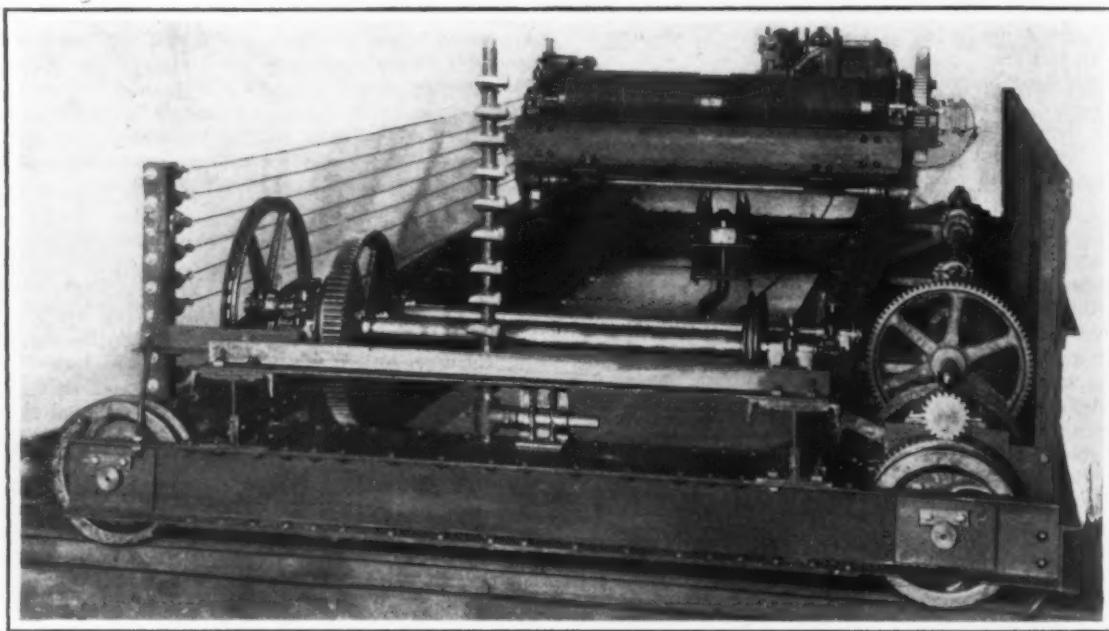
Vertical and horizontal seams are riveted while the tank is suspended by the crane. The sections of the tank are punched and rolled to the required diameter in an adjacent building and transferred to the tower building where they are attached to the bottom section of the tank for riveting. Sections are added and riveted until the tank or pipe is made up to the length required, the usual sizes being 18 to 20 in. in diameter, 30 to 40 ft. long. Heads may be riveted if flanged on the outside.

The crane is of 10 tons capacity, 21 ft. span, and is mounted on a runway 50 to 60 ft. from the floor. The electric motor on the hoist is used for handling the

A Toothless Pinion

A new form of gearing, known as the autopitch, was described in a paper recently read by W. R. Darling before a meeting of the Institution of Engineers and Shipbuilders in Scotland. In this gearing, according to *The Engineer*, London, the wheel is formed with teeth more or less of standard pattern except that their height may be reduced by half. The pinion, on the other hand, is toothless or, perhaps more correctly expressed, has an infinite number of teeth.

In its simplest form it consists of a doubly-flanged sleeve, with a large number of hard steel wires of about 14 gage arranged between the flanges parallel with the sleeve axis. The layer of wires, which is continuous right around the periphery of the sleeve, is retained in position by means of overlapping lips on the flanges. When the wheel is in engagement with the pinion, each tooth of the former as it comes into the meshing position impresses its form in the semi-fluid layer of wires, there being just sufficient freedom among the wires to permit them to spread for the accommodation of the tooth.



Overhead Crane for Serving Vertical Gap Riveter. Vertical and horizontal seams are riveted while the work is suspended by the crane

work to and from the riveter and in riveting vertical seams, the control being designed for lifts to suit the spacing of the rivets. In riveting horizontal seams the tank is revolved by hand on the crane block which is built with the hook mounted on ball bearings.

The trolley is traveled by means of an endless chain arrangement located on the crane girders at the pulpit end, and propelled by a hand chain suspended from the crane to within easy reach of the operator. Both trolley and bridge wheels are equipped with roller bearings. The bridge is propelled by gearing through a hand chain extending from the bridge to the platform. The illustration shows the crane complete with trolley, bridge and footwalk. The trolley travel mechanism consisting of gears, sheave and chain wheel is shown in front of trolley. The bridge travel, shown on the footwalk side, is geared for easy movement of the crane.

All gears have cut teeth and the hoist gears are of cast steel. Shaft bearings are bronze bushed. The drum is grooved and of sufficient length to take rope for the entire lift without overlapping. The crane may be wired for either direct or alternating current. The controller and switchboard for the hoist motor is located on the riveters platform or pulpit.

Owing to improved demand for foundry sand, the Portage Silica Co., Youngstown, Ohio, is operating its property at a rate close to normal. Shipments are from 75 to 80 per cent greater than a year ago, states E. E. Klooz, general manager.

The transmission of power is apparently effected by a jambing action among the wires, which, once the tooth form has been impressed on the layer, prevents the wires from rotating on the surface of the sleeve.

In more developed forms of the pinion, plungers, rollers or other forms of cushion are arranged between the sleeve surface and the wire layer, presumably with the object of enabling the space between the flanges to be fully charged in the first instance with wires, and yet make it possible for them to spread to accommodate the meshing teeth of the wheel. The invention has been further applied to bevel, worm, rack and sprocket chain drives.

Among the many advantages claimed for this gear system is included the possibility of moving the pinion instantaneously or gradually into gear at any speed. It was stated that engagement had been effected at 2000 r.p.m. without shock or danger of any kind. In the discussion on the paper some criticism was directed against the probable efficiency, first cost and wear resisting properties of the gearing.

The Bureau of Mines at its Pittsburgh experiment station is conducting an investigation to devise a rapid commercial method for the direct determination of metallic aluminum in aluminum, aluminum alloys, drosses, etc. A hydrogen evolution method has been developed for the direct determination of the metal. A complete account of the study is being prepared for issue as a technical paper.

IMPURITIES IN COAL

Action Taken by Southern Ohio Pig Iron and Coke Association

At a meeting of the Southern Ohio Pig Iron and Coke Association, held at Ironton, Ohio, on April 4, a resolution was passed, pledging the association to put forth all possible efforts towards the removing of impurities from coal. The subject was introduced by President R. H. Sweetser, who, quoting from a U. S. Government report, stated that during the year 1918, with a production of 600,000,000 tons of bituminous coal, a 5 per cent increase in ash in coal above normal analysis represented 30,000,000 tons of coal, and required 600,000 additional cars to haul from the mines material in the shape of ash, clay, slate and other dirt, which not only was of no value, but was paid for at the going rate for coal.

President Sweetser, in his remarks, suggested to the members of the association and to the consumers of bituminous coal in general that, instead of rewarding the producers of high ash coal with a golden chain of ever increasing prices, they hang on such producers the stigma of their shameful practice, by branding every car of high ash coal with the scarlet letter "A," and the higher the ash, the higher would be the scarlet letter. Anybody acquainted with coal mining knows that in most cases it is possible to produce clean coal, but as soon as it becomes easier to load slate, and more profitable to ship slate, there will be a constant temptation to miner and operator to let this more than useless material go into the market.

Mr. Sweetser's remarks opened up a general discussion of coal and coke, participated in by practically all members present. It was brought out that every 3 per cent increase in ash in coal brings about approximately a \$1 per ton reduction in the value of coke, the figures having been computed by taking a 6 per cent ash coal as a basis. It was also stated that an increase of 1 per cent ash in coke brings a decrease of 19 to 20 tons a day in pig iron production, and that it requires 30 lb. more coke and 30 lb. more limestone per ton of pig iron with each 1 per cent increase in ash over 6 per cent.

Suggestions were made that operators reject coal

containing over 7½ per cent ash. It was pointed out that no standard method now exists for sampling coal, but that the American Gas Association is taking this matter up.

Some of the coke operators present claimed that it was not a fair method to judge coke by the ash content. The nature of the ash must be taken into consideration. Ash in some coke will slag away without interfering with combustibility, while others have ash that will not burn, and still others flux too readily. Some big blast furnace runs have been made on coke from 100 per cent high volatile coals, running 7 to 8 per cent in ash. The best work in furnaces undoubtedly has been accomplished with ash under 6 per cent, but a great deal also depended on the composition of the ash. What is needed apparently is the lowest ash with the best structure.

The A. S. T. M. has made a tentative report on coke testing to be effective at the end of June if not objected to. The association was particularly concerned with the machine shatter test method for hardness of coke, and inasmuch as the tumbling barrel method was now being tried out, it was decided to request the A. S. T. M. committee D-6 to hold over its final decision on coke testing until 1923.

The committee on blast furnace rating reported that furnaces in the district were making record runs, and the records show that furnaces have been burning as much or even more coke in 24 hours than the ideal amount required by the rule of the association, which calls for 60 lb. of coke per cu. ft. of working capacity in 24 hours. The results obtained, left no doubt in the minds of the members that the association's rule for blast furnace rating was the proper one.

An amendment to the constitution, dividing the membership into active and associates, was adopted, active members to be those residing in the southern Ohio and Ashland districts, and associates those residing outside those districts. Four new members were admitted to the association.

A discussion on blast furnace flux was engaged in, and the association intends to go into the subject more thoroughly.

In the evening a dinner was held, after which reports on business conditions were made by many of those present, the general opinion being that conditions in the iron and steel industry were showing a very healthy improvement.

Pittsburgh Basing Point Hearing Continued

CHICAGO, April 10.—The alleged discriminatory charges allowed under the Pittsburgh basing point practice caused the Northwestern Expanded Metal Co., to erect a plant at Jeannette, Pa., declared Howard W. Foote, president of that company, in effect at the hearing before the Federal Trade Commission at Chicago, which was resumed on April 3, after a recess of a week. Mr. Foote's company controls approximately 40 per cent of the steel lath business in the United States. In 1908 all manufacturing was done in Chicago, but today the plant at Jeannette, Pa., manufactures 87½ per cent of all the steel lath produced by the company. He declared that under the Pittsburgh basing practice, his Jeannette factory could supply steel lath to Chicago jobbers cheaper than he could manufacture the same kind of lath in Chicago, using Chicago steel.

"Pittsburgh plus" represents 9.34 percent of the selling price of a standard industrial steel car, asserted A. T. Scannell, owner and manager of the Archer Iron Works, Chicago, in testifying before the commission. His company manufactures concrete mixers of the smaller types, automobile trucks, steel bodies and industrial cars, with an annual total consumption of from 500 to 1000 tons of steel. He asserted that the biggest market for industrial cars is in the East, and when the freight rates from Pittsburgh were advanced to 27c, the company was practically forced out of the car business because of the burden of the increment in freight from Pittsburgh to Chicago which had to be paid in addition to the freight from Chicago to destination. He declared that his company would

have been forced out of business entirely because of the effect of "Pittsburgh plus" if the manufacture of concrete mixers, a market for which is not so largely in the East, had not saved it.

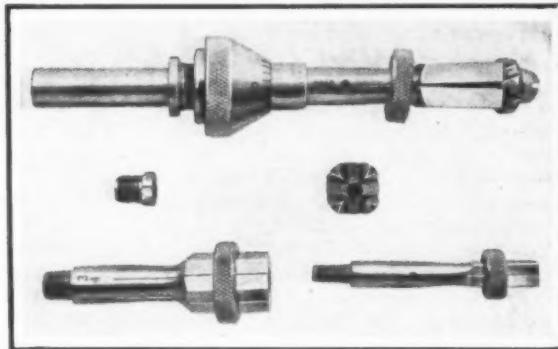
In general, the testimony offered during the past week was similar in character to that brought out in the previous session of the hearing at Chicago, and the hearings at Minneapolis and Milwaukee. Among others who were witnesses during the past week were F. W. Souerbrey, vice-president Keith Railway Equipment Co., manufacturer of railroad cars, Chicago; G. W. Cardinal, vice-president and treasurer, Fitzsimmons Steel & Iron Co., jobber in Chicago and Milwaukee; W. H. Stackhouse, one of the partners of French & Hecht, manufacturers of farm equipment, Davenport, Iowa, and Springfield, Ohio; A. G. Vierling, assistant secretary and purchasing agent Vierling Steel Works, Chicago, structural steel fabricator; F. E. Hughes, general sales agent, Illinois Steel Bridge Co., Jacksonville, Ill.; O. A. Scudder, president Midland Structural Steel Co., Cicero, Ill.; F. A. Ingalls, vice-president, Ingalls-Shepherd division of the Wyman-Gordon Co., Harvey, Ill., manufacturer of steel forgings for automobiles and tractors, and E. W. Whiting, secretary Pheoll Mfg. Co., Chicago, manufacturer of nuts, screws, threaded rods, and similar products.

Production records of the Trumbull Steel Co., Warren, Ohio, were broken last month when it produced in excess of 36,000 tons of finished steel. Its output was 3000 tons in excess of any previous month. Production is being maintained at capacity at its Trumbull and Liberty plants. The company expects to place its new 14-in. strip mill in operation in May.

Adjustable Broaches for Use on Shapers

Adjustable broaches, of the type illustrated, for use in connection with shapers, drilling machines, lathes or screw machines, for broaching of square and hexagonal holes, splines, keyways and other work, have been brought out by the Edward Hollander Tool Co., 142 Miller Street, Newark, N. J.

Within limits the tool can be used in place of a regular broaching machine and although primarily for tool room use is applicable also to production work. It is said to be useful also in the place of square and hexagon drills. Holes that do not go entirely through the work may be broached. The tool is started at its small-



Upper View Shows Broach Assembled. Shank members are shown below

est size in a drilled hole and its size increased with each stroke, a number of strokes being necessary to bring the hole up to size.

The tool is made up as shown, the broach being held in a holder having a micrometer adjustment. The broach or shank member is hollow, with the cutting edges square or hexagonal and split, as shown. The rear end is threaded and screwed into the holder. A rod extending through the shank member has a guide bushing screwed on it, the guide bushing serving to expand the cutter and also to guide it in a way that prevents the cutter from deflecting and getting out of true. The knurled rings shown around the cutters serve to hold the edges together and prevent spreading of the cutter when taking the first cut. Each graduation on the holder indicates an expansion of the cutter of 0.001 in. The holders are interchangeable.

The broaches are made up in sets from $\frac{1}{4}$ to $\frac{3}{4}$ in. across the flats, in steps of $\frac{1}{16}$ in. Larger and smaller sizes can be obtained, as well as single units. The tools are regularly made to cut to a depth of $2\frac{1}{2}$ in. although by means of extension attachments provided the depth of cut may be increased to 5 in. The cutters are sharpened by grinding the front face. It is said that 50 holes can be cut without re-sharpening and the work produced exceptionally free from chatter marks.

Iron and Steel Rates Declared Unreasonable

WASHINGTON, April 11.—In a tentative report made public last Thursday Examiner J. O. Cassidy recommends a finding by the Interstate Commerce Commission that the through rates on iron and steel products, carloads, from Pittsburgh and other points in western Pennsylvania to Cleveland, Lorain and Canton, O., since Sept. 20, 1917, have been unreasonable to the extent they have exceeded the aggregate of the intermediate rates to and from Mahoning and Shenango Valley points, chief of which is Youngstown. Recommendation also was made for reparation to the basis of the combination on the valleys, although the examiner stated that the joint through rates had not been shown to be unduly high.

The proposed report was based on the complaint of the American Shipbuilding Co., et al. vs. the Director General, as agent, Baltimore & Ohio, et al. and also covered a complaint by Frank A. Scott and J. O. Eaton, receivers for the Standard Parts Co. More than usual importance was placed on the report not alone because of the effect its adoption would have on ship-

ments of iron and steel products but also by reason of a situation that has been applying to freight tariff schedules since 1914. The examiner said that disregard of the fourth section had existed since that year, although the complainants challenged them only within the period between Sept. 30 1917, and the date of filing of the complaint.

Big Automobile Demand Predicted

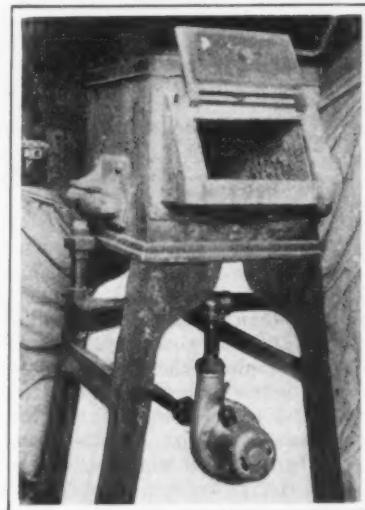
In a statement of J. J. Raskob, chairman finance committee, General Motors Corporation, conditions in the automobile industry were described as steadily approaching normal. Estimating the life of an automobile at from five to six years, the annual replacement requirements are placed at 1,500,000 cars. To this should be added 500,000 cars to cover additional requirements of both old and new users, making a total apparent annual demand of 2,000,000 cars. This is well in excess of the average production of the last few years, and the figure has been exceeded only once in the history of the industry—in 1920, with 2,241,000 cars. As recently as 1914 there were less than 600,000 built.

Electrically-Operated Gas-Furnace Blast

An electrically operated blast designated as the Cadillac, intended for heat-treating and other furnaces has been placed on the market by the Clements Mfg. Co., 601 Fulton Street, Chicago.

Among the advantages claimed are that as the blast is operated from an electric light socket, it may be used while the rest of the plant is shut down. It is designed to draw a sufficient quantity of gas from the mains to develop heating effects without variation. A feature emphasized by the makers is the saving from the speed at which the furnace is brought up to the desired temperature, it being said that the furnace may be brought up to 1600 deg. Fahr. in a few minutes.

The blast is driven by a 1/6-hp. universal motor and is designed to deliver 210 cu. ft. of air per min.



Gas Furnace Blast Driven by Electric Motor

at 10,000 r.p.m. speed of motor. A damper for regulating the mixture of air and gas has been incorporated. The operation is similar to that of a carburetor on an automobile. The mixture should be rich at first and continue so until the furnace is warmed up, the damper being opened gradually to admit air.

The mounting, as shown, weighs 9 lb. net.

The Steel City Iron Co., a new interest formed at Youngstown, Ohio, to engage in structural and ornamental steel fabrication, has elected these directors: A. W. Lau, Oscar Diser, Fred Shurtrump, Fred Hohloch and George Webster. Directors have named A. W. Lau, president and general manager; Fred Hohloch, vice-president, and Oscar Diser, secretary. The company will maintain a warehouse in order to serve its clients promptly. Its capitalization is \$100,000.

Electric Tool Steel Melting Practice

Three Important Factors: Acid or Basic Bottoms; Liquid or Cold Charges and Double or Single Voltage —The Electric Furnace in Other Roles

BY W. J. & S. STUART GREEN*

THE stellar role of the electric furnace is, and rightly should be, tool steel production; and in this it has achieved a signal success. The steel casting industry today absorbs approximately one-third of the entire production of electric steel, though even this tonnage may be insufficient for future demands. Speaking generally the ferrous electric furnace is employed exclusively in the manufacture of tool steel and steel castings. Its flexibility has, however, suggested many other uses, the exploitation of which has met with varying success.

The electric furnace has been sought as the solution of the direct process scheme, whereby steel is made direct from the ore. In this one-act affair it has not and probably will not, in this generation, attain any great commercial success. This is a reluctant conclusion arrived at through a close study of this most fascinating field. Synthetic pig iron has by the ingenuity of man also been selected as a field for the electric furnace, but having in mind the retrograde nature of such a process, it is not surprising that its commercial existence was practically limited to the artificial stimulation of the late war. The production of synthetic cast iron for foundry work also, for similar reasons, has received somewhat feeble encouragement.

In the field of gray iron melting for important automotive castings, the electric furnace has deservedly done much better. Its product is of a superior character and is regularly required by some of the better European and American motor car makers. Likewise for malleable iron castings, the electric furnace seems to have possibilities. One thing is proved, electric malleable iron possesses physical characteristics much superior to those possessed by the product of the air furnace.

Where castings of the highest quality are required, the electric furnace would seem to be the correct melting medium, be they steel, gray iron or malleable iron. In these two latter branches the electric furnace may gradually but surely secure an important position very much as it has done in the manufacture of manganese steel.

Its premier role, however, is tool steel production, and its dominating position is sufficient evidence of its metallurgical and commercial ability to function satisfactorily. The writers' concern is with tool steel only and this article is intended to take its place with the several others of recent date, in the hope that some ideas which they advance, all commercially tried, may be of assistance to others engaged in this youthful industry and possibly thereby to some extent enhance its position. This article is only a part of a general scheme and may we therefore suggest that it be read with the articles, "Electric Furnace Tool Steel Qualities," "Features of Electric Tool Steel Practice" and "Crucible and Electric Tool Steel—Some Aspects of Choice" which were published in *THE IRON AGE* Sept. 15 and Oct. 27, 1921, and Jan. 1, 1922, respectively.

The scope of the present article is to review the major aspects of the three following important ques-

tions, as they affect the manufacture of high grade tool steel.

- I. Acid versus basic bottom.
- II. Liquid versus cold charges
- III. Double versus single voltage.

It is of course apparent that each of these topics is worthy of treatment in individual articles, but we trust the following will be sufficient to accomplish the purpose of this article:

I.—Acid versus Basic Bottom

The lining of an electric furnace above the hearth is generally a matter of choice and not necessarily dictated by the nature of the bottom, be that acid or basic. For instance, the roof is almost universally an acid one, as also is a varying portion of the side walls. The refractories above the hearth have no material effect on the practice adopted; indeed they are frequently identical in both cases, and are not therefore a factor in these considerations.

Claims for Acid and Basic Bottoms

The principal claims for an acid bottom are probably four in number. First, acid bottom materials are somewhat cheaper than are basic bottom materials. Second, acid melting or conversion cost is generally lower due to greater output per turn, by virtue of total absence of refining operations. Under certain conditions this may to a large extent offset its necessarily more expensive melting stocks. Third, comparatively expensive slag materials which are a requisite of the basic practice are not used in the acid furnace. Fourth, a certain belief exists in some quarters that acid steel is superior physically to basic steel.

We find but two major claims for the basic bottom. They are, first, the strong refining abilities of that bottom which permit the purchase of very much cheaper melting materials. This usually more than offsets the increased melting or conversion cost of basic steel, in which case basic steel would be, and generally is, a cheaper steel. Second, the electric furnace with a basic bottom permits the working of the heat under beneficially strong reducing conditions, at such times or at all times as and if desired, to an extent that cannot be approached in the acid furnace.

We have remarked in preceding papers the inability of any furnace to make "a silk purse out of a sow's ear." We therefore stand firmly in opposition to any attempt to make first grade tool steel from shoddy material, however excellently it may be refined from an analytical point of view. On these grounds we are opposed to refining and would certainly not select a basic bottom with such a purpose in mind. The melting stock must possess the required native purity, if high grade steel is to result. Since we do not admit refining as suitable practice for tool steel manufacture, the only claim left the basic bottom, and this an invaluable one, is its beneficial reducing possibilities. This is ample justification for its acceptance and easily warrants any slight extra cost of actual bottom materials. It entails no other additional cost, as refining with its reduction of output and extra energy and labor consumption is not a part of the melting practice advocated.

*220 Larimer Avenue, Pittsburgh.

The basic bottom is advocated solely for its second virtue; its refining abilities are undesirable and should not be exploited in high grade tool steel manufacture. Cost can never be an essential where quality is the aim; it is doubtful, however, whether any extra cost is entailed when the furnace is operated strictly along the lines of a large and efficient crucible. Any difference should be easily offset by the availability of the furnace for the cheaper steels which form a part of everybody's general trade and for which its refining possibilities can and should be used. A still further saving over the acid bottom is effected by the almost complete retention of alloys in the melting stock as charged and, of course, an equally great efficiency with alloy additions.

Comparative Cost of Acid and Basic

We have argued costs and found that basic electric practice should be no greater than acid when carried out as suggested. The authors have had considerable experience with this method and know it to be all that is claimed, both as to cost and quality. Quality is the final judge and it is with this we are most concerned. If we are to duplicate crucible steel, we must operate the furnace in conformity with the major characteristics of the crucible. These characteristics are carefully selected quality melting stocks, which require no refining, and absolute protection from oxidation. Such conditions can be adequately afforded only by the basic electric furnace.

The basic lining has been very generally accepted for the production of tool steel, though not, we suspect, entirely as a result of similar reasoning, but rather that in the earlier days it was not generally believed refining was harmful to high grade steel. The cheaper melting stocks were therefore probably its most attractive feature of adoption; we believe, however, in certain quarters refining was in the past, prior to the introduction of the electric furnace, looked on with a certain amount of disfavor and probably accounted for the belief in some quarters that acid steel was superior to basic steel physically. This was no doubt partly substantiated by personal experience. It will be seen that the basic electric furnace, operated along the before-mentioned quality lines, is not open to such an objection, as refining or "washing" is not attempted.

Be all this as it may, there can be no doubt that the basic electric furnace, with quality melting stock as its charge and operated precisely as a large crucible, is well able to stand unafraid as a producer of fine steels, taking second place to none.

II.—Liquid versus Cold Charges

The question of liquid versus cold charges affects but a limited portion of electric tool steel makers, the facilities for liquid charges, speaking generally, being found only in the hands of a few of the larger steel manufacturers. To briefly define the question; by liquid charges we understand the charging of liquid open-hearth or Bessemer steel, acid or basic, to be deoxidized and desulphurized, etc., in the basic electric furnace. In general the liquid charge is almost entirely open-hearth basic steel, though where a departure from this occurs deduction covering this should be easily drawn from the following thoughts. By cold charges we understand the charging in the electric furnace of cold scrap or selected melting stock, and for the present purpose the furnace is considered a basic one.

With liquid charges the procedure is somewhat as follows: 10, 20 or 40 tons, as the case may be, of mild basic open-hearth steel is poured from the steel ladle to the transfer or charging ladle; to this ladle is added some portion of the necessary carbon addition, generally in the form of anthracite coal, the bal-

ance being added as the heat is poured into the electric furnace, which is effected by means of a portable spout. This operation complete, the current is turned on and the temperature of the chilled metal raised, after which a slag, having deoxidizing and desulphurizing properties, is built; incidentally the general atmosphere of the furnace is made reducing; when this operation is deemed finished (we use the word *advisedly* as against completed), the heat is tuned up to final specifications; the proper steel making precautions are observed and the heat tapped.

Cold Charges Preferred for Tool Steel

If we were successful in conveying our idea of the true purpose of selecting a basic bottom in preference to an acid one, for high grade electric tool steel manufacture, we need hardly say that we do not admit the use of liquid charges as even approaching the equal of cold charges of carefully selected, best tool steel melting stocks, if quality is the objective.

For quality steel no refining can be tolerated, if that refining includes dephosphorizing by the usual oxidizing methods, and we know of no other method. It is a dephosphorized liquid charge the open-hearth delivers to the electric furnace, against which no ordinary single deoxidation process, either in the electric furnace or elsewhere, can in our opinion be adequate compensation, the analysis notwithstanding. We do not care very much whether dephosphorizing has been attempted or not, the necessary contact the metal has had with the oxidizing flame is sufficient alone to render it extremely doubtful whether from such a base the electric furnace could produce the equal of "warranted best crucible steel."

The impoverishing nature of the open-hearth is very generally understood. For instance, no one believes that, given a charge of Swedish steel-making irons, the identical in quality of those used by the crucible, that the open-hearth could produce a steel of crucible quality. If it could it is sure that with its conversion cost something like a quarter of the crucible, it would be very widely used for such a purpose. If this be true, is it reasonable to expect that steel of crucible quality can be made from such a base?

The cold charge, properly selected, offers none of these important drawbacks and, if used in conjunction with a melting practice never more oxidizing than the crucible which is easily possible in the basic electric furnace, it offers the surest means of duplicating the superlative quality of the crucible. We have elsewhere outlined such a practice.

It is true liquid charges under certain conditions and circumstances have excellent possibilities in other directions, such as the production of the cheaper electric steels, for which there is a strong commercial demand. There can be no question that the electric furnace can materially improve the quality of its liquid charge to a degree far greater than can its parent. For such a trade with judicious practice a product of satisfactory quality should and does result. Charges of not less than 10 tons, and preferably somewhat larger, offer the most attractive commercial possibilities. It need not be said here that proper synchronization is an absolute essential and, where available, with all other things equal, liquid charges should satisfactorily meet the demand of its particular field.

III.—Double versus Single Voltage

Any complete treatment of the question of double versus single voltage for tool steel production might best be attempted by the steel maker and electrician in collaboration rather than as in the present case by two steel makers. Our electrical friends have, however, frequently investigated this problem and their findings have been set forth in the technical press. It is possible under these circumstances that a steel

maker's view may be of interest as a means of contrast and is offered therefore without apology, with this purpose in mind and in an unpretentious fashion.

The purpose of double voltage is to increase the thermal efficiency of the furnace and thereby measurably increase the furnace tonnage of a given unit with substantially the existing apparatus. This is accomplished by a greater current input at the earlier or melting down stages of the heat, thereby enhancing the efficiency of the furnace, in so far as can be done without apparent detriment to quality.

In tool steel production, tonnage is not a dominating factor, and this is more particularly the case with the electric furnace when competing with the crucible, where no economies that might even remotely affect quality would be justified. The manufacture of the more competitive and somewhat cheaper electric steels, including steel castings, is the legitimate field to develop the rapid melting voltages, particularly as this field employs slag manipulations for which the double voltage seems desirable. For this class and using cold charges double voltage of satisfactory ratio might well be adopted and its operating economies in the shape of greater output taken full advantage of.

It being questionable wisdom to seek greater output in first grade tool steel production without very cautious development, the writers tried double voltages in a conservative fashion. Their investigation was carried out on a standard 6-ton Heroult furnace and the following remarks refer therefore to practice on that furnace or furnaces of similar design. Certain modifications of design, some of which are to be seen in the new 7-ton Heroult furnace, render a portion of the following observations irrelevant, as will furnaces of other makes possessing these characteristics.

The result of this practical inquiry indicated a high voltage of 115 to 125, with a low voltage of 75 to 85, these pressures and ratios serving very well indeed. We are aware it might be suggested that this is hardly a radical enough departure from single, to be really styled double, voltage, but it is nevertheless as far as we care to go without further information in the manufacture of high grade tool steels. For cheaper work we have no doubt a higher top voltage may be advantageously employed, depending somewhat on local circumstances.

Correct Ratio of the Two Voltages

We early came to the understanding that correct ratio of the two voltages was an important essential. We had experience with a bank of transformers with taps approximately as follows:

High	Low
105	55
113	60
118	65

This ratio between the high and the low voltage is hardly satisfactory for tool steel work if the before-mentioned thoughts on this question are agreed with. Take the first tap 105 high, 55 low. The top voltage is not really high voltage at all, yet is a little too high for constant use during the finishing of the heat. The low voltage of 55 is too low for use during any portion of the heat, the arc being too short and the electrodes consequently washing badly in the slag. Carbon is picked up in uncontrollable quantities and of course increases electrode consumption. The very much lowered current input possible with a low voltage of 55 also renders temperature control unsatisfactory.

The next step of 113 high and 60 low still has the objectional features of too low a finishing voltage. Carbide slags, insufficient current input, etc., still persist with this low voltage.

The next step is the best yet, 118 high and 65 low voltage. This high voltage, which of course is not

really very high, served very well indeed and when used exclusively during the melting down period did no damage to furnace refractories. Its use, however, could not be restricted absolutely to this period, as the low voltage proved to be still a trifle low and had to be augmented at times by the high voltage to attain desired temperature conditions. It will be understood that the use of high voltage at the latter portion of the heat is extremely hard on refractories and also is not favorable to good slag conditions. The low voltage still caused a slight amount of electrode washing, enough to be harmful when making such specialties as engraving plate steel, etc. This low voltage could of course be raised some by still further raising the high voltage, but this we did not care to do for tool steel, though for less exacting work we believe it would be satisfactory. We consider a high voltage of 120, high enough with the present available information for first grade tool steel.

Our conclusion therefore was that a double voltage with a high of about 120 and a low of about 80, offers excellent facilities for quality melting. A single voltage of about 95 volts is ideal for tool steel work, where single voltage has been decided on. It entails no high demand charges, is fool proof and is easy on refractories. Using such a voltage the writers have secured general tool steel service of about 600 operating hours as average life of silica roof and part silica walls on a 6-ton furnace, which seems to be reasonable. Tonnage is not limited materially with such a voltage, at any rate not sufficiently to be any serious item in this class of work. Shop conditions and types of steels affect tonnage quite as much. For ordinary general tool steel work using such a voltage, something like 600 tons should be made a month on a 6-ton furnace; this figure, however, is elastic, and is governed by other factors to a greater degree than voltage.

Summary

Summarizing briefly; the basic bottom is to be preferred. Refining has no part in tool steel manufacture and the basic bottom is not selected for such a purpose. Its ability to carry strongly reducing slags, atmosphere and general melting practice, is its most important advantage and reason for adoption, and is an invaluable asset not possessed by the acid bottom.

Cold charges are recommended. Open-hearth metal, impoverished by its melting conditions, cannot be fully rejuvenated by any ordinary single electric furnace operation. If crucible quality is the aim, high grade melting stocks, melted under quality conditions duplicating the crucible, must be the means. This can only be effected by cold charges melted in the basic electric furnace, under melting practice outlined.

Double voltage of 115 to 125 high and 75 to 85 low serves very well. Higher voltages are not fully recommended for the highest class of work, though apparently all right for medium and cheaper grades, and possibly with more information may ultimately prove satisfactory for work of the highest type. A single voltage of about 95 is a very satisfactory all-round pressure, from which excellent results as to life of refractories, output and quality of product can be obtained. When in doubt, this voltage should be used for tool steel work in preference to all other systems.

Full agreement with all of the foregoing is not expected, nor for that matter desired. We do trust, however, that these papers have been successful in achieving at least some portion of the stated purpose and the resultant greater exploitation of this most remarkable melting medium, the electric furnace.

The Koppers Co., Pittsburgh, has resumed work on the construction of a 30-oven battery of coke ovens for the Woodward Iron Co., Woodward, Ala. This work was suspended 15 months ago.

New Pouring and Lifting Device

The combination of geared ladle and half-ton pouring and lifting device illustrated is a development of the Modern Pouring Device Co., Port Washington, Wis., for work requiring 150 to 300 lb. bull ladles. The geared ladle may be easily replaced with a smaller ladle when desired.

The lifting apparatus is intended for use also in machine shops, structural steel shops and other places where loads within capacity and not requiring more than a 3-ft. lift are transported continuously. In this case a set of grab hooks may be attached to the machine. Compared with the chain block the advantage claimed for the device lies in the speed of the raising and lowering, a few strokes of the lever raising the load to the desired height, the lowering being al-



Geared Ladle and Half-Ton Pouring and Lifting Device for Work Requiring 150 to 300 Lb. Bull Ladles. Lifting apparatus can be used for other purposes also

most instantaneous, although completely under the operator's control.

The raising apparatus is made up of a rack sliding in a steel frame guided by two supporter rods with a swivel connection at the upper end for rotating the machine. A gear meshes in the rack and is rotated by pulling on the lifting lever, which is arranged with a steel dog engaging in a ratchet. A brake band and drum with four pawls which operate on a ratchet are provided on the right side of the device. The pawls serve to hold the rack at various heights. The machine is lowered instantaneously or gradually to any height by disengaging the pawl in the raising lever and relieving the brake band. For accurate work, such as closing a mold, the rack can also be lowered with the lifting lever by relieving the brake band at the same time. The lifting lever has a compound gear which by shifting gives lifting ratios of 12 to 1 for high speed, and 15 to 1 on low speed.

A cast steel yoke and bail frame for holding the ladle shank is provided at the lower end of the rack. The gearing for tilting the ladle is made up of a cast steel gear and a cut steel worm, the ratio of which permits full control of the flow of metal from the ladle. It is claimed that one man can handle a 600 to 800 lb. ladle easily and continuously.

The entire structure is said to be designed to make pouring operation safe. The frame, shank, bail gearing and other parts subject to strain are of cast steel and the worm and gear adequately inclosed in housings to protect them from the metal sparks and dust.

Combination Punching and Shearing Machine

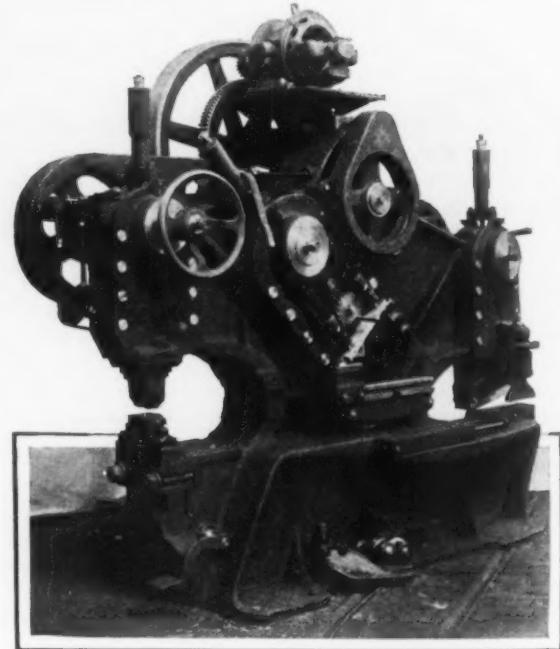
An improved design of the triple combination solid steel frame punching and shearing machine marketed under the trade name Oeking is being offered by Amplex, Inc., 6 West Thirty-second Street, New York.

It may be noticed in the accompanying illustration that the operator's side of the machine is clear of all encumbrances such as flywheels and driving gears, all of which are placed on the opposite side. A slanting centering slide to permit mitering cuts to be made without lifting the angle bar to be cut, has been provided. The plate shear knives are 13 in. long for the No. 16 machine and 16 in. long for the No. 20, as against the former lengths of 9 and 11 in. respectively. Ample room is provided behind the knives to avoid binding of the plates when being cut.

The punch is arranged for punching both webs and flanges of structural shapes and the height of the throat designed to accommodate broad-flanged Bethlehem shapes. The punch is provided with a lowering device to locate the center mark before punching and both hand and foot levers are provided for throwing the machine into gear. The springs and gears have safeguards.

The bar and angle cutter is for any shape of structural material, but the standard equipment is for rounds, squares, angles and tees only. Knives can be conveniently changed for cutting beams and channels.

The frame is of cast steel and the slides, which are adjustable, of cast steel also. The covers of the slides



A Slanting Centering Permits Mitering without Lifting the Angle Bar Being Cut

are attached to the body by pin bolts ground to fit in position, a feature intended to prevent the covers from working loose. The bearings have ample surface, are bronze-bushed and provided with ring lubrication. All gears are cut.

The machines are built in sizes from No. 13 to 32. The No. 13 will split $\frac{1}{2}$ in. plates, cut $3\frac{1}{2}$ -in. angles and will punch $\frac{3}{8}$ -in. holes in $\frac{1}{2}$ -in. material. The No. 32 will split $1\frac{1}{4}$ -in. plates, cut $8 \times 8\frac{3}{4}$ -in. angles and punch $1\frac{1}{4}$ -in. holes in 1-in. material. Provision has been made for cranes, gages and other attachments, which are provided if required.

Arthur G. McKee of Arthur G. McKee & Co., engineers and contractors, Cleveland, gave an illustrated talk on blast furnace development March 30 before the Engineers' Club of the Youngstown district. He explained blast furnaces from their origin to their present state of development. Prof. L. W. Chubb, head of the radio department of the Westinghouse Electric Co., Pittsburgh, will address the club April 27.

ORE RATE CASE

Iron and Steel Makers Petition to Be Allowed to Intervene

WASHINGTON, April 11.—Iron and steel makers in eastern Pennsylvania have filed a petition with the Interstate Commerce Commission asking to be allowed to intervene in the ore rate case on which a hearing is to be held in Washington, April 24. This proceeding originally grew out of the protest of the Buffalo iron and steel makers against reduced rates on ex-lake ore, which, like those on eastern "local" ore, have been suspended.

The petition of the eastern Pennsylvania producers denies allegations made by the Buffalo makers as to discrimination in favor of interior furnaces because of not only the reduced ex-lake rates, which now have been suspended, but also because of the old rates, which have been restored. The Buffalo producers contend that these ore rates are unduly low as compared with the rates on coal and coke to the Buffalo district.

The eastern Pennsylvania producers say in their petition "that the changes which have been made in freight rates on furnace materials since 1917 not only have not diminished the natural advantage of Buffalo and vicinity as producing points for pig iron and iron and steel products, but have greatly increased such natural advantages to the corresponding prejudice and disadvantage of your petitioners, who at the present time have greater difficulty than at any time in the past in competing with the furnaces and plants of complainants."

The petition was prepared by a rate committee consisting of Robert C. Lee, chairman; W. A. Barrows, Jr., N. L. Moon, and Richard Peters, Jr., secretary. The petitioners are: Alan Wood Iron & Steel Co., Colonial Iron Co., Delaware River Steel Co., E. & G. Brooke

Iron Co., Empire Steel & Iron Co., Eastern Steel Co., Robesonia Iron Co., Ltd., Reading Iron Co., and Thomas Iron Co.

As has been pointed out by THE IRON AGE, the reduced import rates on foreign iron ore remain in effect while the high rates on domestic ex-lake and Eastern ore have been restored since Jan. 1. The commission, of course, does not have authority to suspend rates once they have gone into effect unless it possibly might be done under section 15a of the transportation act, a procedure that has never been tested. Under this section the commission is directed to initiate, establish and modify rates which will yield as nearly as possible 6 per cent on the value of the property of the carriers. As to the ocean rate alone, the commission obviously has no authority, so that furnaces on the Eastern seaboard served directly by vessels would not be affected by higher rail rates. It is assumed that even if higher rail rates on ore imports could be ordered under the transportation act or through other means, consumers who use foreign ore would enter a protest.

It is interesting to observe that despite the fact that the old and higher rates on domestic ore have been in effect since the first of the present year, while the reduced import rates and lower prices on foreign ore have been in effect since last October, imports have been small and those of February less than those of January as shown in the following table, reported in gross tons:

Imports from—	January, 1922	February, 1922	7 Months	8 Months
			Ending January, 1922	Ending February, 1922
Spain	6,667	2,489	12,269	14,758
Sweden	—	7,459	20,359	27,817
Canada	31	68	3,259	3,327
Cuba	10,450	—	36,547	36,547
Other countries	2,285	1	3,621	3,622
Total	19,433	10,016	76,055	86,071

URGING DELIVERIES

Consumers Anxious to Receive Products Ordered in the Youngstown District

YOUNGSTOWN, April 11.—Manufacturing consumers of steel products are pressing the mills for deliveries. As a consequence of the advance in sheet prices April 1, makers have established a comfortable backlog, accepted at the old levels. The principal independent producer of wire products in this territory is booked ahead for 30 days, and, though offered business, declines to obligate itself further. Price advance in nails which was expected for some time materialized last week, quotations moving up from \$2.40 to \$2.50 per base keg. This interest reports a heavy demand for wire nails for building.

In view of the general situation prevailing, prices are firmer all along the line. Valley pig iron makers are holding to a minimum of \$18.50, and some interests confidently believe \$19 could be secured for standard basic. Because of their own iron requirements for steel making, several district producers have withdrawn from the merchant market. Foundry grades have predominated in recent transactions.

Trunk line railroads operating through this district already report some slowing up in movement of coal, but this has not been appreciable as yet, as supplies had been established at the mines. The strike has spread to the mines of the Youngstown Sheet & Tube Co. at Nemacolin, Greene County, Pa., operated on an open shop basis, and production has been largely curtailed. Normally this property has been producing from 1200 to 1500 tons per day. A small mine of the Republic Iron & Steel Co. at Republic, Pa., has been forced into idleness.

Blast furnace interests which purchase their coke requirements on the open market are likely to feel the effects of the strike in advance of producers which are self-contained. In the Mahoning Valley, by-product coke plants are operated by the Sheet & Tube company.

the Republic company and the Brier Hill company. The stack of the Trumbull-Cliffs Furnace Co. at Warren secures its coke under contract from the Sheet & Tube ovens.

In spite of the more serious aspect of the situation, operations are still holding at a high level in the Valley, finishing mills averaging in excess of 70 per cent.

While demand for the lighter steel products is still dominant, buyers are showing an increased disposition to come into the market for heavier products. Steel bars have particularly felt the influence of this stimulus, and an independent interest has booked a considerable tonnage of light bars. Prices of plates and merchant bars are firm at \$1.50. Little new plate business of consequence is being placed here, aside from the regular requirements of a steel car repair interest. The principal independent plate maker is quoting steel plates from 1.60c to 1.75c.

The Trumbull Steel Co. announces that it has advanced hot strip steel \$2 per ton, to a minimum of 2c. This compares with recent prices ranging from 1.75c to 1.90c. Cold-rolled strip is uniformly quoted at 3.65c. Most business on the books, however, was taken at prices below the current market. The Ford Motor Co. has placed a sizable order for black sheets and hot strip with an independent.

Quotations on tin plate are nominally \$4.75, but the mills are well occupied on tonnage taken at \$4.60. Specifications on tin plate are coming out freely.

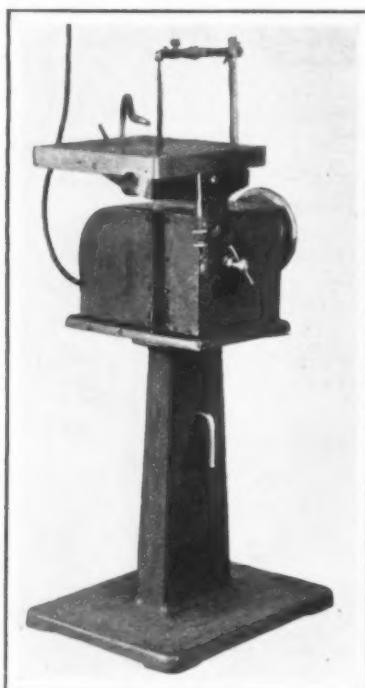
The new prices on semi-finished material are firm, but there is no let-up in demand for sheet bars by non-integrated interests, which are operating on a higher average basis than at any time since 1920. The general sheet bar quotation is \$31.

Valley steel interests, which have been buying ferro-alloys for a month or two ahead in most cases, have altered this policy, believing that the bottom of the market has been passed. One large steel plant has covered on its requirements for spiegeleisen and ferromanganese over the rest of the year, in furtherance of this policy.

Bench Type Die-Filing Machine

A small die-filing machine in two sizes, Nos. 3 and 4, has been placed on the market by W. D. Rearwin, 716 Monroe Avenue, Chicago. It may be mounted on a bench or provided with a pedestal equipped with disappearing casters, as illustrated, for convenient moving about the shop.

Power is supplied by a $\frac{1}{8}$ -hp. motor, taking current from an electric light circuit. To protect the motor from dirt and filings, a sheet metal case fully inclosing



The Pedestal Is Equipped with Disappearing Casters

it is provided as shown. The stroke is adjustable up to 3 in. and three changes of speed obtainable.

The table is 12 in. square and is arranged to tilt four ways, permitting various degrees of clearance to be filed in the dies. Graduated dials facilitate setting the table to the desired clearance angles. Grooves are provided in the top of the table to keep the work clear of the filings. An adjustable hold-down keeps the work from being forced up with the file. Special or standard files may be used as the upper arm has a wide range of adjustment in all directions and is designed to hold the files secure.

The weight of the machine without the motor and column is approximately 60 lb. The No. 3 machine is practically the same as the No. 4, but smaller.

New Type of By-Product Coke Oven

Announcement has been made of the development of a new type of by-product coke oven, designed by Joseph Becker, consulting engineer of the H. Koppers Co., Pittsburgh. The design is covered by patents. A battery of these ovens has been in continuous operation at the plant of the Chicago By-Product Coke Co. since late in January. The average coking time is reported as under 11 hr., while on tests the oven has carbonized in $9\frac{1}{2}$ hr.

Perfect heat control, insuring a coke ideal for metallurgical purposes, is reported as an outstanding feature of this new oven. Tests have been made on different grades of coal, including the straight high volatile coals from Pennsylvania and Kentucky, as well as Illinois coal.

In this connection, it is pointed out that coke has been made from Illinois coal for a number of years in Koppers ovens. In 1917, the Bureau of Standards conducted a test along these lines at the plant of the Minnesota By-Product Coke Co. at St. Paul, and showed that a satisfactory grade of metallurgical coke could

be made in these ovens from Illinois coal. Brief mention of these Minnesota ovens was made in THE IRON AGE Feb. 7, 1918, page 388, and the story of the tests was told in our columns July 31, 1919, page 283.

Advance in Japanese Duties

WASHINGTON, April 11.—Sharp advances in Japanese import duties on copper and copper products have been made as the result of the passage of a bill by the Japanese diet, which became effective on March 30, according to a cable dispatch received by the Department of Commerce from Acting Commercial Attaché H. A. Butts, at Tokyo.

The exact amounts of the new duties per picul of 133 lb., in yen (one yen being the equivalent of 50c.) as compared with the old are as follows:

	New Rates	Old Rates
Copper ingots and slabs.....	7 yen	1.20 yen
Copper bars and rods.....	15 yen	8.90 yen
Copper plates and sheets.....	16 yen	9.95 yen

These advances, it is pointed out, had been anticipated for some time, in view of the severe competition which the Japanese copper industry had been subjected to from the heavy imports of foreign copper produced at lower costs. The dispatch says that the present increases are intended to be temporary, although no definite period is given.

Breakage of Rock Drill Steels

WASHINGTON, April 11.—Investigation of breakage and heat treatment of rock drill steels and other steels and alloys subjected to similar impact stresses is to begin immediately under the direction of F. D. Foley, metallurgist, Bureau of Mines, formerly in charge of iron and steel investigations at the Minneapolis experiment station. He has just been selected to undertake this work and is to be assisted by Henry S. Burnholz, a mining engineer of New York. Another metallurgist is to be named to aid in the investigation which is being conducted jointly by the Bureau of Mines and the Bureau of Standards in cooperation with an advisory committee composed of representatives from the interested engineering societies.

Portland Cement Production in 1921

Estimates by the U. S. Geological Survey show a production of 98,293,000 bbl. of portland cement during the last calendar year, this being 1.7 per cent below the high record of 100,023,245 bbl. in 1920. Shipments during the year are placed at 95,051,000 bbl., or only 1.3 per cent below the 1920 high record of 96,311,719 bbl. The average price in bulk at the mill was \$1.87 in 1921, compared with \$2.02 in 1920, a decrease of 7.4 per cent.

Heavy Movement of Cars

YOUNGSTOWN, April 11.—March records of railroads serving this district show a gain of 35 per cent in the number of loaded cars as compared with March, last year, and an increase of 10 per cent over February. Coal figured heavily in the movement, but in the last half of the month steel products moved from the district at a rate unequalled in the past 18 months. Owing to diversion of open top equipment to the coal mines, an actual shortage of mill type gondolas and flat cars existed for a time.

The Pyrene Mfg. Co., Inc., has moved into its new factory at 520 Belmont avenue, Newark, N. J. The general offices, formerly located in New York, and all manufacturing departments, are now under one roof. G. P. Rogers, general sales and advertising manager, says that it is the purpose of the Pyrene company to provide a department for the sale of first aid and fire fighting appliances and safety devices, from "No Smoking" signs to gas masks, hand-drawn chemical engines and hand fire extinguishers.

National Survey of Trade Associations

Replies to Questionnaire in Regard to Activities Show Interesting Facts—Co-operation with the Government by Some Organizations

BY L. W. MOFFETT

WASHINGTON, April 11.—The National Association of Manufacturers has just completed a survey of trade associations and their activities. It is based on a questionnaire sent out some time ago and is the most complete, if not the only, document of the kind ever prepared. It is replete with illuminating information and the association believes it will be a potent influence in allaying much ill-considered agitation, political and otherwise, against trade associations, and at the same time will be helpful not only to industries of the country but to Government officials who are establishing closer relations with business interests, a policy which is particularly true of the Department of Commerce, and has been ever since the advent of Herbert Hoover as Secretary. The great number of replies received by the National Association of Manufacturers reveal that the associations are not only willing but are anxious to make public their activities, and for the most part are also desirous of cooperating with the Government as well as with their own respective industries.

Subject of Speculation

The subject of trade associations, their activities and legal rights, long has been a matter of much speculation and has become increasingly important since the decision by the Supreme Court in the Hardwood lumber case and the subsequent correspondence between Attorney General Daugherty and Secretary of Commerce Hoover bearing on these questions. There also has been much criticism lately in Congress regarding trade associations and bills have been introduced for investigation of their activities. The National Association of Manufacturers, seeing the trend of events, concluded to let the business associations investigate themselves and feels that the result of their survey is an adequate answer to charges by some members of Congress that trade associations constitute a "pernicious lobby." Two or three bills have been introduced which propose to license the "lobby." Last week two bills were introduced, one in the House by Representative McArthur and one in the Senate by Senator Edge, calling for an investigation of business associations with the view of regulating them. It is only fair to say, that some who have supported the idea of investigating trade associations are not antagonistic toward them, but on the contrary are aware of their constructive force and feel that an investigation would establish this fact and consequently be a wholesome influence. It is considered, however, that the information now given on the subject makes an inquiry unnecessary. Tomorrow the business associations are going into a conference with Secretary Hoover, other Government officials and trade paper editors to decide how the Government and these associations can work together. The results of the survey of the National Association of Manufacturers have been published and the pamphlet will be available to the Government officials and trade association representatives when their meeting begins. The questionnaire contained 21 questions and 135 answers from national associations are published in the pamphlet. There have been daily reports from additional associations since the pamphlet was published.

Large Annual Budgets

The reports have been received from organizations which in the aggregate have an annual budget somewhere between \$5,000,000 and \$10,000,000 representing the expenses of only a part of the national associations. The associations knew the Government would

want to know what use was made of these organizations which cost such a tidy sum annually and consequently gathered this information and printed it in book form. It is now available for either Congress or the Government departments. In this volume is given information relating to the name and address of each association; the purpose for which it is organized; the number of departments it has; and, what those departments do either in the way of improving business practices or in dealing with Governments, State or local. In this way it is pointed out the associations have investigated themselves.

A survey shows that the one question which aroused greater interest than any other is transportation. The question to which least attention has been paid by the national organizations is labor. In the matter of legislation, the subjects of most interest are taxes and tariff, with more interest in the tariff than in taxes. In the relation of these associations to the industries the one question which has aroused the most careful attention is the standardization of grades of production and machinery. The question of secondary interest is in regard to uniform contract. A minimum of attention has been paid to credit information or group insurance.

Many Replies Received

The associations which replied to the questionnaire represent on the average 64.9 per cent of the business of the country in their particular lines. It was found that of the first 100 associations, 92 have direct membership and 11 are federations, and it is believed this average has been maintained generally throughout all the associations. The apparent discrepancy in the figures is accounted for in the fact that the three of the hundred associations have a dual form of organization. Most of the associations declare that the primary purpose is to improve and extend acquaintance among the members in a certain industry. The elaboration of purpose is mainly toward the nationalization of trade association methods and aims. A few of them express a truly national purpose. These associations show by their date of organization that they are of more recent development. Three of those included in the first hundred depart radically in form from the local or trade associations. One of these brings to light an entirely new form of association. A second shows its national character by organizing to engage in only the national aspects of its industry. A bare majority of 51 per cent have organized their activities under at least a few definite departments with salaried chiefs. The others adhere to the older method of working through committees of volunteers. The tendency seems to be in the former direction.

Co-operating with Government

In the matter of cooperating with scientific bureaus of the Government, 31 of the first 100 reported that they are beginning something of the sort; four are cooperating on matters of education; eight are making reports of the activities of their industry; and ten are working on the matter of standards. Concerning the vital statistics of industry, 18 are working with the Government without specifying in what ways; 34 gather reports about production; eight about costs; seven about prices; and four about distribution. Of these various associations, eight specified that these reports are given to the public and nine that the

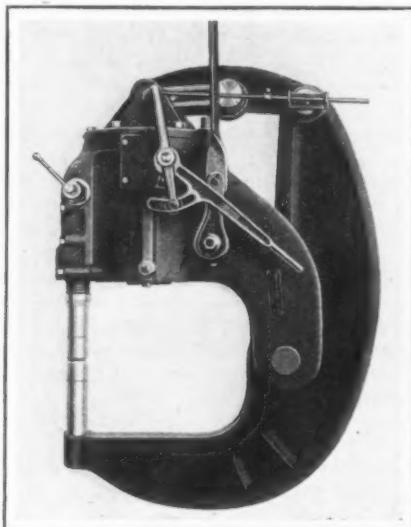
(Continued on page 1041)

New Shepard Pinch Bug Riveter

A Shepard pinch bug riveter having a reach of 20 in. and a gap of 11½ or 18 in., depending upon whether a short channel jaw or long girder jaw is used, has been placed on the market by the Hanna Engineering Works, 1765 Elston Avenue, Chicago. The unusual flexibility of the machine is a feature emphasized by the makers.

The machine is shown in the accompanying illustration. It is intended particularly for light and medium weight structural riveting, such as roof trusses, plate girders, beam-box girders, crane girders, plate and channel columns, small plate and angle columns, steel car sills and similar work. Its capacity is 50 tons on the dies at 100 lb. air pressure. The weight is 1490 lb. which is pointed out as small in proportion to the capacity and, in fact, lighter than standard compression yoke riveters of similar specifications.

The angular movement is small, which is due to the



Pinch Bug Riveter with Flexibility an Outstanding Feature

long radius from hinge pin to die axis, allowing greater lower die length variation. The die stroke is 3½ in. The machine is equipped with a removable valve plate, an extra plate and valve permitting maintenance of the valve without shut down.

In this machine the upper die does not move as the rivet is driven, when the machine is suspended with dies vertical, cylinder up. The rivets are struck from the top and driven from below. They may be inserted in advance of the machine itself, a feature which permits the "rivet sticker" to devote some of his time to drift pins and stitching bolts without interrupting the continuous operation of the machine.

A suspension pin is provided about which the machine is free to revolve and is located so that riveter when suspended naturally assumes a position in which the upper die screw is exactly vertical. The upper die screw remains vertical whether the unit is open or closed as the center of gravity shifts but slightly during such movement.

The proper working suspension is said to be easily obtained by merely hoisting the machine to the point where the upper die just rests on the work.

Anniversary of H. C. McNair Co.

The H. C. McNair Co., St. Paul, Minn., will, on May 1, celebrate its thirty-eighth anniversary in business. This company is the oldest concern of its kind in the iron, steel and railway supply business established in the Northwest. It was originally founded by H. C. McNair, who went from St. Louis in May, 1884, to make his home in St. Paul. Upon his death in July, 1911, he was succeeded by his son, H. H. McNair.

The company represents as sales agent in the St. Paul territory several large steel and allied interests, notably the Crucible Steel Co., of America, New York; Falcon Steel Co., Niles, Ohio; Falcon Tin Plate Co.,

Canton, Ohio; Bliss & Laughlin, Inc., Harvey, Ill.; National Bolt & Nut Co., Pittsburgh; Etna Forge & Bolt Co., Pittsburgh, and others of a similar nature.

In 1921 the activities of the organization were broadened with the addition of Edward Kopper, who entered the firm. Mr. Kopper is a graduate of the University of Minnesota, 1913, is a member of the A. S. M. E. and secretary of the St. Paul section. Mr. McNair received his education at the University of Minnesota and at the Sheffield Scientific School of Yale University. Both are members of the Psi Upsilon fraternity.

The present officers of the company are: H. H. McNair, president; Edward Kopper, vice president and R. A. Websky, secretary and treasurer.

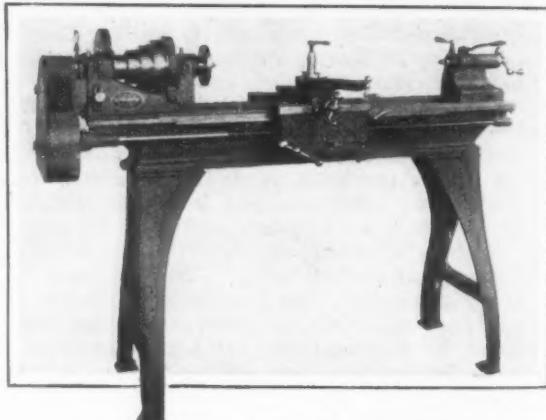
Lathes Added to Seneca Line

The Seneca Falls Mfg. Co., Inc., Seneca Falls, N. Y., has added to its line a new screw cutting engine lathe known as the Handy, which will be made in sizes from 9 to 13-in. swing and in the usual bed lengths.

The new lathe is a general purpose machine, designed, it is said, especially for the radio industry and for starter and magneto service stations. It can be arranged for either belt or motor drive and all of the regular attachments of the company's Star lathe may be used in connection with it. Either bench or floor legs as illustrated are provided.

The machine has back gears, power longitudinal and cross feeds, large hollow spindle adapted to draw-in chucks, graduated cross feed screws, set-over tailstock and plain or compound rest. The equipment also includes a double friction countershaft with cone belt shifter on countershaft and self-oiling bearings.

A small plain turning lathe having a 10½-in. swing, 3-ft. bed and taking 12 in. between centers has also been placed on the market by the Seneca company.



Either Bench or Floor Legs Are Provided

This lathe is equipped with plain rest and feeds from 0.002 to 0.040 in. per revolution of the spindle. It has a set-over tailstock, open belt, three-step cone and self-oiling spindle. The countershaft is of the tight and loose pulley type, with roller bearings in the loose pulley. This lathe will be of special interest perhaps to companies making small parts for electrical apparatus.

Dillon Brothers Machine Co., Wheeling, W. Va., organized last fall and chartered under the laws of Ohio with a capital of \$150,000, succeeding the Dillon Bros. Co., general machinist, a partnership, is planning a modern machine and forging shop to be located in Bridgeport, Ohio, on the lines of the Baltimore & Ohio and Cleveland & Pittsburgh railroads. The company does general machine work, coal mine repairs and industrial machine work of all kinds. The building probably will be of structural steel, hollow tile and steel sash, with the floor of reinforced concrete or of slow burning mill type. An overhead crane will be wanted for the machine shop, while for the forging shop, one large and a small hammer, with heating furnaces and other equipment will be wanted.

Changes in Economic Life of China

Transportation Costs an Important Factor—Wages of Coolies

Per Day Low, but Railroads Much Superior—

Japan Buys Chinese Ore

WASHINGTON, April 11.—An unusually illuminating and instructive bulletin on "Changes in the Economic Life of the Chinese People," prepared by Commercial Attaché Julean Arnold, Peking, China, has been distributed by the Far Eastern Division of the Department of Commerce. The author shows that he has made a close study not only of the history of ancient and mediaeval China, which is given concisely and interestingly, but he also points out the progress that this oriental country has made during the past two decades. Mr. Arnold says that, viewing the developments of the past 20 years, China has during this period made marvelous strides. He points out that, while China has its shortcomings, none appreciate this better than do the Chinese people themselves. It is one thing to know that something is wrong, Mr. Arnold states, and quite a different matter to know just how to proceed to remedy the fault. He declares that these people merit the kindly constructive sympathy of the outside world. He then adds:

Departure from Simple Life

"The changed condition, which the Chinese people are now meeting, means a departure from the simple life characteristic of these people for so many centuries. It means the application of science to life in all its phases. It means railway, factory, and office schedules. It means group activity. Individualism must give way to collective organization. Unless the human being as a machine can hold up against this new order, the new China will be a failure. As a prime consideration, the health and physical welfare of the individual must be safeguarded. Modern medicine, surgery, and sanitation must come to his assistance. Fortunately the Rockefeller Foundation has come to China's aid in the encouragement of modern medical education and sanitation in the very broad-visioned way."

Mr. Arnold, after making his introductory remarks, outlining the evolution of the mind of the Chinese people, the early civilization of that country and its more favorable attitude toward western education, turns to its development of its resources.

High Cost of Transportation

It is a far cry from transportation by coolie labor with its small volume of slow-moving traffic to the great volume and fast-moving railroad traffic of a modern country, and the difference in cost is just as well emphasized. For instance, Mr. Arnold points out that: "On the road from the Wei Basin to the Chengtu Plain one may meet coolies carrying on their backs loads of cotton weighing 160 lb. They will carry these loads 15 miles a day for 750 miles at a rate of 17c. per day, which is equivalent to 14c. per ton-mile. At this rate it costs \$106.25 to transport one ton 750 miles. The railways should be able to haul this for \$15, or one-seventh the amount. The Peking-Mukden Railway carries coal for the Kailan Mining Co. at less than 1½c. a ton-mile."

Iron Deposits and Works

Turning to Chinese iron deposits and works, Mr. Arnold says:

"Linked with coal in the industrial development of any nation is iron. Here again China's resources have been greatly exaggerated. V. K. Ting gives the known iron reserve of China, taken from the results of six years of work of the Geological Survey, as 677,000,000 tons, distributed as follows: 91,500,000 in Chihli Province; 387,000,000 in South Manchuria; 23,000,000 in Shantung; 160,000,000 in the Yangtze Valley Province,

and 7,500,000 tons in Fukien Province. He estimates this amount as probably about one-half of China's total reserve in iron ore and conservatively places the total at 1,000,000,000 tons. Thus Mr. Ting gives China about one-quarter the reserve of the United States, four-fifths that of England, and one-third that of France or Germany before the war. The present annual production of iron ore in China is about 1,500,000 tons, of which about two-thirds is smelted in China. In the United States the production of iron ore in 1920 was 70,000,000 tons and about 36,000,000 tons of pig.

"Japan has contracted for 1,000,000 tons of ore annually from China for the next few years. The exceedingly low per capita consumption of pig iron in China is noteworthy. It equals about 0.0025 ton per head, compared with a consumption of 0.34 ton per head in the United States, a very significant contrast between the industrial developments in America and the situation in China. There are eight iron works constructed or under construction in China, with a total output equal to about 1,000,000 tons.

Cost of Production

"The question of transportation figures again in its relations to the iron industry in China. The slowness in the development of this industry appears to be due in a large measure to transportation. D. K. Lieu, former cost accountant of the Hanyang Iron & Steel Works, in a very illuminating series of articles which appeared in the Peking *Daily News* this last summer, contrasts the cost of the production of pig iron at the Hanyang works with that at the Japanese plant at Penghsihu, Manchuria, the former costing \$48.50 silver a ton and the latter but \$22 a ton. The Hanyang works draws upon its own stores of ores, producing its coke from its own coal mines; hence the market fluctuations in the prices of raw materials did not enter into calculations. Mr. Lieu attributes the greater part of the difference in costs to the one item, coke, and shows that it is the transportation factor which is accountable in the main for this. The coke landed at Hanyang from Pinghsiang, a distance of about 200 miles, costs \$24.54, compared with a cost of \$5.74 at Penghsihu. At Penghsihu, however, the coke is used where it is produced, so transportation is not a factor. The ore at Hanyang cost \$6.55, compared to \$5.10 for the ore at Penghsihu. The Hanyang works have their own boats to carry coke and ore, yet the cost is very high. Mr. Lieu contends that if cheap railway transportation be substituted for the boats the cost could be greatly reduced. Although the Penghsihu iron involved much lower production costs, when transported to the market it was sold at more than \$40 silver a ton.

"Mr. Lieu therefore concludes that unless transportation is facilitated, China cannot expect to compete with other nations in mineral production; that is, develop basic industries which produce bulky commodities made from equally bulky raw materials. The hopeful sign in connection with the development of a modern industrial society in China lies in the fact that the Chinese are now appreciating the interrelationship of transportation, fuel, and basic raw materials.

Non-Ferrous Resources

"China has also minerals other than coal and iron. Over 50 per cent of the world's resources in antimony are accredited to China. During the war this mineral was in heavy demand and China profited greatly thereby. In the production of tin China ranks next to the Malay States and Bolivia. The exports for 1920 amounted to about \$15,000,000 silver. Practically all of this came from Yunnan Province. Kwangsi and

Hunao provinces contain some deposits, but here again the difficulties of transportation have prevented development. In copper China is apparently poor, having probably exhausted most of its resources in this metal which has figured so prominently in the arts and industries of the people.

"Lead and zinc are found in Hunan and Yunnan. Under present conditions it does not pay to work these deposits. The disturbed political conditions and poor

transportation in Hunan undoubtedly account in a measure for the present inactivity. During the war there were heavy shipments of tungsten, molybdenum, and manganese from China, used in connection with steel manufacture, but the sudden drop in prices and other unfavorable factors resulted in cutting off the demands from abroad. The local consumption is not as yet sufficient to make the working of these mines profitable."

STEEL COMPANY WINS

Important Suit Carried to Highest Courts—Decision for Pittsburgh Manufacturer

Litigation of unusual interest to manufacturers has finally been decided in favor of the American Steel Co. In June, 1917, the MacDonell Chow Corporation, New York, purchased from the American Steel Co., Pittsburgh, a large quantity of tin plates, of a value of about \$42,000. The goods were destined for export, and the American Steel Co., knowing nothing of the financial responsibility of the buyer, insisted upon having a bank credit to cover the purchase price of the goods. The purchaser, which was a depositor in the Irving National Bank of New York, procured from that bank a letter of credit, under which the bank agreed to pay the contract price of the goods on presentation of draft for the purchase price of the goods, accompanied by bills of lading endorsed in blank. The duration of this credit was limited to a time sufficient to permit the manufacture and export of the goods. The American Steel Co. was delayed in the manufacture of the goods owing to a fire which occurred in its mills in the summer of 1917, but eventually manufactured them and notified the customer, MacDonell Chow Corporation, of its readiness to ship. A dispute had by this time arisen between the American Steel Co. and its customer, by reason of the delay in manufacture, and the purchaser refused to accept the delivery of the goods, and thereupon notified the bank, which had at its request issued the letter of credit, not to pay drafts drawn on the letter of credit. The purchaser also cancelled the shipping instructions which it had previously given to the American Steel Co. The American Steel Co., which had manufactured the goods in reliance upon its expectation of prompt payment, ignored the instructions of cancellation and thereupon delivered the goods to the railroad company, procured bills of lading, and tendered them, accompanied by a draft for the invoice price of the merchandise, to the bank, with a request that it honor the draft. The bank, acting under its instructions from its depositor, refused to make payment. Thereupon the steel company brought suit against the bank in the United States District Court, Southern District of New York, for the amount of the draft. The action was strenuously defended, the bank insisting, through its counsel, that the terms of the contract between the MacDonell Chow Corporation and American Steel Co. were to be read into the letter of credit, although that letter of credit made no reference to the contract. It further insisted that it was entitled to avail itself of the purchaser's claim that the goods were not shipped within the time limited by the sales contract. The action came on for trial in April, 1919, before Judge Dietrich and a jury, and the judge after hearing the evidence adopted the contention of counsel for the bank, and dismissed the plaintiff's complaint without submitting the case to the jury. The steel company thereupon took an appeal to the Circuit Court of Appeals, which in a unanimous decision reversed the decision of the court below, and disposed of the defendant's claim in an opinion reading, as far as pertinent, as follows:

There is but one vital question involved in this case. It is whether the letter of credit already set forth herein is a complete and independent contract between the plaintiff and the defendant. This court is satisfied that it is, and that by it the defendant gave authority to the plaintiff to draw upon it up to the sum of \$43,250 and impliedly promised to pay

drafts so drawn, when accompanied by certain specific documents, to wit, the invoices and bills of lading, provided the drafts were drawn and presented prior to the expiration of the credit on June 13, 1918.

The defendant in effect seeks to read into the contract a provision that the plaintiff's rights under the letter of credit should be subject to the superior right of the MacDonell Chow Corporation to modify the contract which the bank had made with the plaintiff. We do not so understand the law.

This opinion of the court is reported in 266 Federal, page 41.

Following the reversal by the Circuit Court of Appeals, the action was again moved for trial by the steel company, and was retried in November, 1920, before Judge Learned Hand and a jury. The court, following the decision of the Circuit Court of Appeals, directed a verdict for the plaintiff for the full amount of its loss, the plaintiff meanwhile having consented, in the interests of justice, that the verdict should be reduced by the amount which it had realized upon a resale of the merchandise, although it was not obliged to make this concession. The defendant thereupon took an appeal from the judgment, to the Circuit Court of Appeals, which unanimously affirmed the judgment without opinion. Further efforts were made by the bank to review this decision by an application to the United States Supreme Court for a writ of certiorari, but this, in turn, was denied by the United States Supreme Court, and the full judgment has since been paid by the bank.

The case, which is one of first impression in the Federal Courts, is of interest to the trade by reason of the fact that it holds that a bank, under such a letter of credit, is not entitled to avail itself of defenses which might be open to the purchaser of the goods, were it sued in a direct action by the seller for non-performance of the contract of purchase.

The decision would not necessarily be controlling in a case where a letter of credit contained other stipulations which might conceivably be included in its provisions, viz., requiring the seller of goods to satisfy a bank that it had performed its contract of sale; and a manufacturer, relying upon such a letter of credit, should satisfy himself that the obligation of the bank is expressed in unconditional terms.

Advisory Committee for Southern Experiment Station

An advisory committee, composed of representatives of the industries more especially interested in the investigations being conducted, has been chosen for the Southern Experiment Station of the Bureau of Mines at Birmingham. The personnel of the committee is as follows:

C. E. Abbott, Tennessee Coal, Iron & Railroad Co., Birmingham.

C. E. Bowron, Gulf States Steel Co., Birmingham.

W. M. Lacey, Woodward Iron Co., Woodward, Ala.

W. J. Penhallegon, Republic Iron & Steel Co., Birmingham.

J. E. Strong, Alabama Co., Birmingham.

H. J. Thomas, Sloss-Sheffield Steel & Iron Co., Birmingham.

The question of organizing advisory committees, to be composed of prominent representatives of the mining and metallurgical industries, at all of the experiment stations of the Bureau of Mines, similar to the ones that have already been organized at the Mississippi Valley and Southern stations, is being considered, and it is thought that it may be found feasible to organize such committees at several of the other stations.

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ESTABLISHED 1855

THE IRON AGE

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The Public Will Not Pay

One issue stands out above all others in the coal strike. It is the question whether coal mining and coal miners shall be exempt from the deflation of war prices in which the vast majority of the American people have shared in the past two years. In the hearing before the House Labor Committee at Washington this week a coal strike leader, when asked why the coal miners should insist on getting 31 per cent higher wages than they had at the peak of prices during the war, seeing that farm products have fallen 50 per cent, replied that the fact that farmers were not organized was no reason why the miners should come down in their demands. "The difference between us and the farmers," he added, "is that we are resisting."

The issues involved in the coal strike are by no means simple. Coal mining is an industry with problems. Largely these grow out of the fact that there are too many coal openings in the country and too many men are trying to get a livelihood by mining coal. There are thick veins and thin veins, and mines close to centers of consumption and mines more remote. In the old days when the destinies of soft coal operators in the Central West were to a large extent in the hands of railroad executives, the advantage one mining district might have over another was offset by the imposition of higher freight rates. Coal mines having a long haul to lower lake ports, for example, were given a lower rate so they could get their share of the trade in coal moved by vessel to the Northwest. Railroad control was done away with, but labor union control came in its place. In the four-State agreement which the organized miners seek to perpetuate the union leaders put up or put down wage rates in different districts so as to offset the advantage one field may have over another. The consumer carries the load of the high cost mines. The principle of national bargaining which railroad labor was able to fasten upon the railroads under Government control has been pushed just as far in the coal mining industry as the power of the unions could carry it.

The leaders of the union coal miners have been just as unwise as the leaders of the railroad workers in ignoring the public feeling over the

extortionate prices which the unions seek to perpetuate. In 1913, according to the statement of President Lewis at the Washington hearing, miners' day wages were on the basis of \$2.84, while the "basic day wage" under present conditions is \$7.50. Workers at steel plants have accepted reductions of 40 per cent from the war basis. Textile workers have been reduced. In practically every industry and in all the retail and wholesale merchandising trades of the country wages have been reduced to meet the universal demand for a reduction in the war-time cost of living.

In three key industries—coal mining, transportation and building—labor union leaders have resisted every proposal to have the workers share in a readjustment which has affected practically all other classes of the community. The case of the railroad workers and of the inordinate freight rates from which all business is suffering is in process of adjudication. In due time it is to be expected that transportation costs will be reduced and that thereby industry will be helped on its way to recovery.

There has been much charge and counter-charge in the statements of operators and union leaders. The public is not so much concerned about the responsibility for the shutting down of the mines as about ways and means of getting cheaper coal. It would be well, therefore, for the strike leaders to consider what they should do now to meet the public's demands, rather than to concentrate, as they have been doing, on an effort to put the operators in a bad light. Tactically the operators may have made a mistake in refusing to enter a conference. Had they gone in, they would have saved themselves from the charge of breaking one part of the 1920 agreement and the representatives of any district would still have been free to announce their unwillingness to proceed with a four-State agreement on the old lines.

The notice the union leaders have served that they will do nothing to reduce the present unreasonable prices of fuel is not calculated to enlist public support for the union miners' effort to extend their influence over non-union fields. For many months the line-up has been that of the coal mining, railroad and building trades unions

against all other classes in the community. In the end the miners will be defeated in this strike, mainly because the vast majority of the American people are against contributing to an aristocracy in labor. The public will not spring to the support of a small percentage of the whole army of workers that insists on maintaining a war-time scale of wages at the expense of the farmer, the machinist, the molder, the clerk and every other class of workers and buyers that already have suffered the pinch of depression and deflation.

The Manganese Ore Duty

Light is thrown on the proposed duty on manganese ore by U. S. Geological Survey figures just published showing that only 13,531 gross tons of ore over 35 per cent in manganese came from American mines in 1921 as against imports of over 392,600 tons. The domestic output in 1920, a year of large consumption, was only 94,420 tons. In both years about 90 per cent of the domestic production came from Montana, which yields a grade of ore of little value in blast furnace operations. While domestic manganese ores have their value, it is rather a strategic one. The country's manganese resources should rather be conserved for a day of emergency. Nature has bestowed upon other countries the manganese ores from which such ferromanganese as is needed for our great steel output can be made—an output greater than the combined outputs of all other countries. And our importation of such manganese ores makes it possible for the countries producing them to buy from us products for which we want markets abroad.

Such a manganese ore duty as the Fordney bill provides, and the high ferromanganese duty which was imposed in line with that on ore, means a tax on our steel manufacturers of 27 cents on every ton they produce. It would be an anomaly to impose a duty on raw materials for revenue purposes, and the proponents of the Fordney tariff have distinctly said that this manganese ore duty is intended as a measure of protection to the mining of domestic manganese. But why tax every ton of steel produced in the United States for an industry that under the stimulus of war prices was able to deliver manganese ore sufficient for only a small fraction of the country's output of steel?

The Senate tariff bill, reported since the above was written, provides for free manganese ore, with a measure of protection to a merchant ferromanganese industry which has demonstrated its vitality as well as its capacity for service to the steel industry as a whole.

At the peak of costs in August, 1920, building material costs averaged 212 per cent above 1914. At that same time, labor costs were 100 per cent above the pre-war figure. The average between these two figures, weighted according to the proportion in which labor and material enter into building, gave final construction costs at 167 per cent above pre-war. Heavy declines in building materials have left their costs now about 98 per

cent above the pre-war average, while labor, which was later to liquidate, is now about 65 per cent up. This leaves the general construction cost about 85 per cent higher than in 1914. The reduction from the high spot of nearly two years ago is thus some 30 per cent.

Pernicious Labor Legislation

For years one of the most vicious forms of special legislation has been the amendment tacked on to appropriation bills forbidding the Department of Justice to use funds to institute proceedings against labor unions. Despite the earnest efforts of a minority, appropriation bills have been amended in this way year after year. But it is gratifying to know that last week the House defeated an amendment offered to the joint appropriation bill of the Departments of State and Justice which would have prohibited any use of the funds for the Department of Justice in prosecuting "any organization or individual for entering into any combination or agreement having in view the increasing in wages, shortening of hours or bettering conditions of labor, or for any act done in furtherance thereof not in itself unlawful." The amendment also would have prohibited the use of money for the prosecution of producers of farm products and associations of farmers who co-operate and organize in an effort to "obtain and maintain a fair and reasonable price for their products."

Owing to the closeness of the vote, 63 to 75, and the failure of many members to cast their votes, the victory is not so decisive as it ought to have been, and it is too much to hope that the action of the House means an end to such legislation. An important fact is that the amendment was urged specifically as an immediate aid to coal strikers and was preceded by an amendment of even more pernicious and discriminatory character. Representative Denison of Illinois had offered an amendment, which was rejected, providing that none of the money appropriated should be expended for the payment of any salary or compensation for legal services in connection with any suit or other proceeding brought in any court to enjoin any officers or members of a labor organization from suspending or quitting their employment.

Mr. Denison frankly admitted that he was more particularly interested in labor organization at this time than in other things and that the fear of coal miners was that the power of injunction would be invoked against them. He referred to a previous experience when injunction proceedings prevented the calling of a strike and the payment of funds to support strikers. Conditions are different at the present time and no one has proposed to bring injunctions to prevent the strike. On the contrary, the feeling has been general that it would be well to allow the strike to proceed. Nevertheless certain members of Congress were willing to rush in and try to prevent any legal action against the unions.

It is a matter for congratulation that these efforts have received at least a temporary setback. They have not prevented the granting of an im-

portant injunction in the United States Court at Charleston, W. Va., forbidding six specific groups of acts. Union men are forbidden to limit the rights of the companies which employ non-union labor, or to restrain the rights of the companies and employees to contract with each other. The court also enjoined the union men from committing acts of insurrection, murder, violence, intimidation, threats and other unlawful acts, and the defendants are restrained in general from any act that would interfere with free competition among those seeking employment. They are also enjoined from doing anything to create monopoly of mine labor with the purpose of unreasonably increasing wages. All these are proper subjects for injunction, but such an injunction as that issued in West Virginia could not be granted after the enactment of the law if the efforts of the Congressmen to amend the bill had been successful.

Last Year's Rail Production

Production of rails in the United States in 1921 was 2,178,818 gross tons, or 16.3 per cent less than in 1920 and 42.8 per cent less than in 1906, the record year. Only two of the years since 1906 showed smaller production than last year—1908 and 1914.

Rails are used for a variety of purposes, and the statistics of production in the different weight classifications give an idea of the relative demand in different quarters. Unfortunately the export statistics do not show section weights, so that a precise study of domestic consumption by section weights is impossible. Some conclusions, nevertheless, can be drawn.

Exports of rails were 594,628 tons in 1920 and 322,107 tons in 1921, there being a decrease of 46 per cent, against the 16 per cent decrease in production. It is improbable that any noticeable tonnage of rails was exported in weights of 100 pound and over, hence it may be assumed that the decrease in export demand did not affect the production of this class of rails, and we find that the production increased from 729,118 tons in 1920 to 849,566 tons in 1921. In the production statistics a separate classification of rails 100-pound and over has been made only since 1914, but the 1921 production was the greatest in the period and there is no doubt that it was the greatest that has occurred.

In rails 85-pound to 99-pound production decreased from 952,622 tons in 1920 to 902,748 tons in 1921, or only 50,000 tons. Of the decrease of 270,000 tons in exports certainly more than 50,000 tons is to be ascribed to rails 85-pound to 99-pound. It follows that of both 85-pound to 99-pound and of 100-pound and over the domestic consumption materially increased from 1920 to 1921. In the lighter rails, there was a decrease from 433,333 tons to 214,936 tons in 50-pound to 84-pound, and a decrease from 489,043 tons to 211,568 tons in rails 45-pound and under.

In other words, the industrial consumption of rails was cut in half from 1920 to 1921, while the steam railroad consumption of rails slightly increased.

There is ground for placing considerable reliance on the estimate that in the past ten years the rail worn out in service on the steam roads has averaged between 1,000,000 and 1,500,000 tons, and nearer the lower figure, while with the traffic in prospect, but no other change, the wear in future would likely be 1,500,000 tons a year or more. However, in the past eight years the production of rails 100-pound and over has averaged 675,000 tons a year, and the putting into service of these heavy rails, in practically all cases just where the traffic is densest, is certain to have an influence in decreasing the annual wear of the rails as a whole. In percentages of the total steel tonnage we shall never have the big rail years we used to have. Too many other products have passed rails in point of tonnage.

The statistics of production furnish their own testimony that the railroads are disposed to depend upon section of rail and methods of rolling and inspection to increase durability. In 1912 there was produced 3455 tons of electric steel rails and in 1913 2436 tons, while outputs since then have been negligible, there being only five tons reported for 1921. In 1911 there were 152,990 tons of rails treated by titanium and in 1921 only 2804 tons, while in 1913 there were 11,864 tons of rails treated by other alloys and in 1921 only 3472 tons.

Bessemer rails are getting down close to the vanishing point. At 55,000 tons last year the Bessemer output was only one-twentieth of that for 1912, the last year in which the Bessemer total exceeded 1,000,000 tons. In 1907, or five years earlier, it was no less than 3,380,000 tons, with open-hearth at 252,000 tons.

CORRESPONDENCE

The Business Cycle and the Metal Trades

To the Editor: I am very glad to note the article in your issue of March 23 written by Prof. Nathaniel R. Whitney. I had occasion to see some of Professor Whitney's work in forecasting business conditions as contained in an article that he wrote in January of 1920. This article had a keen analysis of the conditions existing at that time and called the turn for that year with an accuracy that is uncanny to one who does not realize the mass of data and analysis on which the forecast was made.

Professor Whitney does not pose as a prophet, but he takes facts as they exist, and judging the future by the past, which he has studied very thoroughly, he is able to trace out the operations of the causes that make for boom or depression, for recovery or decline.

If more business men would recognize the value of this sort of service and would conscientiously and intelligently study these causes and their effects, and would lay their plans for production and marketing in accordance with reliable information, rather than with hunches and guesses, some tremendous losses would be saved. The more men that regulate their businesses in accordance with the cycle, the less violent will be the fluctuations of the cycle itself, because the excesses of booms and depressions are due to maladjustment between supply and demand, which comes about through ignorance of the conditions and their meaning. This ignorance lies in the men who themselves cause the maladjustment; and naturally, the fewer business men we

have who do not realize what is going on, the less will be the maladjustment.

I am glad to note that THE IRON AGE proposes to follow up Professor Whitney's work with a series of articles, presenting statistical and diagrammatic exhibits of the business trend. I have long felt that a good analytical article dealing with the iron business, which is so important a part of our whole industrial structure, could well appear every month and such an article would be of great value to both producers and consumers in indicating the reaction of the economic forces.

E. F. DUBRUL,

General Manager, National Machine Tool Builders' Association.

Cincinnati, April 4, 1922.

Reogle Steel Co. Acquires Empire Steel & Iron Co.

Negotiations which have been under way for some time for the acquisition of the Empire Steel & Iron Co. by the Reogle Steel Co. were completed this week. It is understood that the Reogle Steel Co. has paid about \$1,800,000 for the properties of the Empire Steel & Iron Co., the stock being acquired on a basis of 65 for the \$2,500,000 of preferred stock and 15 for the \$1,254,770 of common stock. At a meeting held in New York on April 11, Leonard Peckitt, who has been president of the Empire Steel & Iron Co., was elected president of the Reogle Steel Co. J. Leonard Reogle is chairman of the board. The purchase of the Empire company will be financed by the issue of 125,000 additional shares of the stock of the Reogle Steel Co. at 30. The total of the new capital thus secured, \$3,750,000, will leave nearly \$2,000,000 of working capital after the purchase of the Empire Steel & Iron Co. stock. The entire issue of new stock has been underwritten.

The Empire Steel & Iron Co. has been a factor in the Eastern pig iron trade for many years. Through its ownership of the entire capital stock of the Crane Iron Works it has two furnaces at Catasauqua, Pa., with a capacity of 180,000 tons per year. It has also the Oxford furnace at Oxford, N. J., with a capacity of 70,000 tons, and Macungie furnace at Macungie, Pa., 30,000 tons, and Topton furnace, Topton, Pa., 40,000 tons per year. It owns 2400 acres of iron ore land at Oxford, N. J., together with mineral rights on 8000 acres additional; 1700 acres of ore land at Mount Hope, N. J., with large reserves of magnetic ore, and 115 acres of land on Pine Island, N. J., containing a large body of limestone. It controls the Victoria Coal & Coke Co., having coal lands at Caperton, W. Va., and 135 coke ovens. The properties include also the Mount Hope Mineral Railroad, 5.6 miles, running from Wharton to Mount Hope, N. J.

The Reogle Steel Co.'s properties at Wharton, N. J., were described in THE IRON AGE of Oct. 7, 1920. Two modern blast furnaces were built in 1919-20, which with ore handling and auxiliary plant involved an outlay of about \$3,000,000. The furnaces are rated at 500 tons per day each. The article referred to described the very extensive developments at the Reogle mine, formerly the Scrub Oaks, and the concentrating plant, having an output of 1000 tons of 60 per cent concentrate per day. The sintering plant at the new furnaces consists of two double strand Dwight & Lloyd machines with a capacity of 600 tons of sinter per day. The Reogle Steel Co. operates the Wharton & Northern Railroad with 23.5 miles of main track. It has a limestone quarry at Ogdensburg, N. J., about 20 miles from the furnaces.

The starting up of one of the new furnaces at Wharton is now under consideration. The ultimate plans of the company contemplate the building of a steel plant at Wharton, and in the canvass of possibilities in finished products prominence has been given to seamless steel tubes, sheets and tin plate. With the acquisition of the Empire Steel & Iron Co. properties the Reogle Steel Co. becomes one of the leading producers of merchant pig iron, its seven blast furnaces giving it an annual capacity of 600,000 tons.

MARCH INGOT OUTPUT

Yearly Rate Nearly 32,500,000 Tons or Over 20 Per Cent More Than That of February

The steel ingot statistics of the American Iron and Steel Institute show that 30 companies, which in 1920 produced 84.20 per cent of the total, had an output in March of 2,370,751 gross tons as compared with 1,745,022 tons in February, according to revised data. Estimating the production of other companies on the basis of the 30 companies (though it is probable the small companies did not equal the rate of the larger ones), the total output of ingots in March was 2,815,618 tons or 104,282 tons per day, counting 27 working days for March. The daily output in February averaged 86,350 tons so that the March output averaged over 20 per cent better than that of February.

In the table below, the output of Bessemer and open-hearth works is separated and the figures for 1920 by months are included:

Monthly Production of Steel Ingots by 30 Companies Which Produced About 84.20 Per cent of Total in 1920—Gross Tons

	Open Hearth	Bessemer	All Other	Total
January, 1920	2,242,758	714,657	10,687	2,968,102
February	2,152,106	700,151	12,867	2,865,124
March	2,487,245	795,164	16,640	3,299,049
April	2,058,336	568,952	13,017	2,638,305
May	2,251,544	615,932	15,688	2,883,164
June	2,287,273	675,954	17,463	2,980,690
July	2,135,633	653,888	13,297	2,802,818
August	2,299,645	695,003	5,784	3,000,432
September	2,300,417	693,586	5,548	2,999,551
October	2,235,863	676,634	3,485	3,015,982
November	1,961,861	673,215	3,594	2,638,670
December	1,687,162	649,617	3,586	2,340,365
Total, 1920	26,197,843	8,112,753	121,656	34,432,252
January, 1921	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total, 1921	13,125,578	3,679,682	21,686	16,826,946
January, 1922	1,260,809	331,851	822	1,593,482
February	1,395,835*	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751

*Revised.

The March ingot production was at yearly rate of 32,431,702 tons, counting 311 operating days to the year. This compares with a rate in February of 26,814,420 tons, in January of 23,542,500 tons, and with 11,857,186 tons in July, the low point for 1921.

The increase of 625,729 tons in the ingot output of all companies reporting in March over February contrasts with an increase of 404,803 tons in the March pig iron output over February.

At the annual meeting of the Refractories Manufacturers' Association recently held in Chicago, the following officers were elected: President, Arthur P. Taylor, Charles Taylor Sons Co., Cincinnati; vice-president, Frank R. Valentine, M. D. Valentine & Brother Co., Woodbridge, N. J.; treasurer, C. C. Edmunds, McLain Fire Brick Co., Pittsburgh; secretary, Frederic W. Donahoe, Pittsburgh; executive committee, R. A. B. Walsh, Walsh Fire Clay Products Co., St. Louis; Porter S. Kier, Kier Fire Brick Co., Pittsburgh, and J. J. Brooks, Jr., Harbison-Walker Refractories Co., Pittsburgh.

Reading Iron Co. to Advance Wages

The Reading Iron Co., Reading, Pa., has posted notices at its plant of an advance in wages, effective April 15. Puddlers, who have been receiving \$6 per ton, will get \$6.50 and the common labor rate is to be advanced from 22½c. to 24½c. per hr., with other wage rates advanced correspondingly.

Coal Strike Situation Becomes Serious

Many Mines in the Connellsville and Northern West Virginia Districts Idle—Some Furnaces Banked and Blowing In of Others Delayed

PITTSBURGH, April 11.—The coal strike situation as it pertains to the non-union workings in western Pennsylvania and West Virginia is proving really serious. Only a small percentage of the mines in the Connellsville district are in operation and there has been a virtually complete suspension in the northern West Virginia field. Where the union leaders have failed to organize the men, they seem to be successful in keeping men away from the mines through intimidation. To-day's reports note the suspension of additional operations of the H. C. Frick Coke Co., which has only four or five of its important mines producing coal. This company has about 55 mines and coke plants in the Connellsville region, and reliable information indicates that in addition to those which were idle when the trouble broke out, fully 20 have since suspended. The Pittsburgh Steel Co., the Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co., all having coal mines in the Connellsville district, also have suffered from the voluntary or involuntary failure of miners to go to work. Independent coal producers have fared no better, and there is no disposition to question the accuracy of the Government reports showing that last week's production of non-union coal was about 3,500,000 tons, as against an expected non-union production of between 5,000,000 and 6,000,000 tons.

The situation in the Connellsville district has struck the steel industry at an extremely vital spot in the output of coke and the operation of blast furnaces. There have been no important suspensions of blast furnaces and steel works, but unless there is an early settlement of the trouble, a number of blast furnaces dependent upon Connellsville coal or coke soon will be obliged to bank. The Republic Iron & Steel Co. has banked one of its Hazelton, Ohio, furnaces, due to the fuel situation, and the American Steel & Wire Co. has been obliged to bank one of its furnaces at the Schoenberger works, Pittsburgh. The Carnegie Steel Co. has rescinded orders for the blowing in of blast furnaces at a number of outlying plants, and also for starting up of the steel works at Mingo, Ohio, and Farrell, Pa. It was the intention of this company to put on a furnace of the Isabella group and blow out one for relining. The furnace to be relined was blown out last Saturday, while the blowing in of the one to go on has been deferred. With its coke supplies largely cut off, it is probable that the Pittsburgh Steel Co. will bank the one furnace it has in blast before long. Furnaces in Buffalo and in the East having contracts for coke with Connellsville producers are getting practically no shipments. There is a good stock of coal available for by-product plants in Buffalo, which may delay the suspension of furnaces in that district, and one of the large by-products interests in the East is understood to have a large accumulation of coke which may be helpful to eastern Pennsylvania furnaces.

The big reserve supplies of coal accumulated in anticipation of the strike are not proving so helpful as it was expected they would be in offsetting the curtailed production. One example is that there are large stocks of coal at sheet and tin plate mills which may not be wanted in the event that steel production is affected through the suspension of blast furnaces and the curtailment in the output of pig iron.

Marketwise, the effect of the fuel situation has been to stiffen the pig iron market rather sharply, with foundry grade already up \$1 per ton from its recent minimum of \$19, furnace for No. 2 grade, while basic iron is not available at less than \$18.50, and some producers would not consider selling even at that price. So little coke is available that it is extremely difficult to arrive at quotations. There have been sales of furnace coke at \$4 per net ton, ovens, but there is talk that \$2 to \$3 per ton more than that would have to be paid by consumers who elect to keep their furnaces going. The Steel Corporation is reported to have bought a good deal of spot offerings of coke and also to have contracted to take the production of two batteries of a by-product plant having a stock of coal sufficient to keep these batteries running for the next 60 days. A number of steel manufacturers have virtually withdrawn from the market, chiefly because of the fuel situation.

Many Idle in Connellsville District

UNIONTOWN, PA., April 8.—Effect of the union coal strike on the unorganized Connellsville bituminous region up till today—the end of the first week of the strike—has been greater than had been anticipated by operators and observers in the region. Practically the entire southern Connellsville or Klondike region has been thrown into idleness by unorganized men who have quit work.

The first defection in other sections of the region occurred today when Lemont and Continental mines of the H. C. Frick Coke Co. were idle. Continental is on the outskirts of Uniontown. Lemont is close to the Mt. Braddock plant of W. J. Rainey, Inc., where men went out several days ago, but where it was thought that the trouble was an isolated instance and the result of the strike of employees at Mt. Braddock last summer when Rainey cut wages below the Frick scale.

Granting that the effect in the region is greater than had been anticipated, the effect has not been up to the hopes of the union organizers. The union men are making a concerted drive, admittedly so, to organize the Connellsville bituminous field, believing that if they win over this field and especially the plants of the H. C. Frick Coke Co., subsidiary of the Steel Corporation, they will have gone a long way toward winning the national coal strike. Many observers believe that next week will be the critical week in the situation in this region. That the region will not be organized without a fight is admitted in every quarter. There has been no effort, up until today, to fight the organization of the men. There has been no interference with the meetings of the men. There has been no disorder. When the men quit work at the plants in the Klondike field, the mines were closed and other operations in the region resumed. The coming week is expected to witness the first moves of the Frick and independent companies in fighting the organization of the fields. The independents will follow any lead set by the Frick company.

While organizers have counselled against intimidation of workers, there have been some reports received by THE IRON AGE correspondent that men wanting to go to work have been prevented from doing so by other groups of union men or sympathizers. It is likely that these acts were isolated, however, and were not sanctioned by the union leaders.

The exact status in the lower Connellsville region is reflected in the car placements for today's loading. For shipment by Pennsylvania lines, the Monongahela

railroad, which serves practically all plants of the southern Connellsville district, placed 29 per cent coal and 20 per cent coke cars. For shipments by the Pittsburgh & Lake Erie the placements were 33 per cent coal and 23 per cent coke. While this is a decided falling off from the pre-strike percentage of 100, the showing is regarded as favorable under the circumstances.

Still another means of showing very concretely what the effect of the walkout has been in the lower Connellsville region and the Fayette County side of the Monongahela Valley is shown in the average movement of loaded cars over the Monongahela Railroad, as compared with the average in February. In the southwest territory, the daily average of coal moved the first week of April was 342 cars against the February average of 335. The average coke movement showed a gain of 100 per cent, the average during the first week of April having been 213 cars; in February 119 cars. In the river section, the coal average was 91 cars last week as compared with 372 cars in February. Coke movement showed the same rate of increase as in the southwest territory, the average this week being 72 cars and in February 36 cars.

Stops Expansion at Youngstown

YOUNGSTOWN, April 11.—Spreading to non-union workings in greater measure than anticipated, the coal miners' strike is becoming a more serious factor in the steel industry. Leaders in the steel industry show more concern over the situation than at any time since the strike threat was originally promulgated.

Suspension of non-union mines in the Connellsville district will be felt by steel plants in the Mahoning Valley, if the strike is sufficiently protracted, inasmuch as much Connellsville fuel is consumed by district industries.

Immediate effects of the strike on steel operations in this territory have been to prevent expansion, rather than to curtail output as yet.

The Carnegie Steel Co. has countermanded orders to light three additional stacks in the Youngstown district, and has canceled the resumption of the Farrell Pa. works, which were being placed in readiness for production starting Monday of this week. Eleven open hearth furnaces, blooming and bar mill complements were to have resumed. No. 2 blast furnace of the company at its Farrell plant, which was blown in April 1 to furnish hot metal for the open hearth furnaces, has been banked.

Resumption of a second blast furnace in the complement of the Brier Hill Steel Co. is being held up, until the extent of the coal strike is more fully determined.

Small Production of Coal

WASHINGTON, April 11.—The total production of all coal, anthracite and bituminous, in the first week of the strike was the lowest in modern coal history, according to the Geological Survey. The output of bituminous coal dropped to approximately 3,500,000 tons, and in the anthracite region work ceased entirely. During the 1919 strike, the anthracite mines operated at capacity, and during the first week of that strike bituminous production was 3,582,000 tons.

The record of production during March removed all reasonable doubt that the 52,500,000 net tons of soft coal in the hands of consumers on March 1 had increased to 63,000,000 tons, or more, by the opening day of the strike. The quantity on hand on April 1 was therefore equal to the maximum stock at the end of the war.

Back of this stock of 63,000,000 tons in the hands of consumers, April 1, there was a further reserve of over 4,000,000 tons on the upper lake docks, and a smaller quantity stored on the ground at the mines or at intermediate storage yards. These figures take no account of the coal on wheels, including a heavy tonnage of unbilled loads on hand at the mines when work stopped in the union districts on Saturday.

Anthracite is stored commercially in three places

—in retail coal yards, on the upper lake docks, and in the storage yards of the producers. Retail coal dealers' stocks on March 1 were about the same as a year ago, but much larger than in 1919 and 1920. Stocks on the lake docks were 821,000 tons on the same date. No statistics of anthracite in producers' storage are available for March 1. On Nov. 1 last, there were 4,500,000 gross tons in the yards, of which 40 per cent was domestic sizes.

In addition there is a surplus of 1,000,000 tons of coke on hand at by-product coke works, much of which may be considered a substitute for anthracite.

STEEL FABRICATORS ORGANIZE

Trade Expansion Campaign Planned and Rationalizing of Building Codes One Object

A number of the leading steel fabricators of the country have become affiliated in an organization just formed, known as the National Steel Fabricators' Association. An association of the same name, growing out of one of the service committees centered in Washington to assist the War Industries Board and other agencies during the war, was disbanded in November. The new association has for its object the establishing of standards, such as making the requirements of building codes rational and uniform, so far as possible, and generally it is to act as a guiding influence in the economical use of steel for buildings. For example, it may be that in some building codes the allowable stresses may be limited to 14,000 lb. per sq. in., and in others for structures to meet identical situations the stress may be put at 16,000 or 18,000 lb. per sq. in. There is apparently a need for uniformity.

The affairs of the association will be in charge of L. H. Miller, who has resigned his position with the Cleveland office of the Bethlehem Steel Co., to take up the work of the association with the title of managing director. His headquarters will be in Cleveland. He has been connected with the Cleveland office of the Bethlehem Steel Co. for 14 years, as structural steel sales engineer of that company and structural steel engineer of the Bethlehem Steel Bridge Corporation.

It is expected that the association will become an authority on unit stresses in structural steel design and on building codes and cost systems for fabricators. It is thought that its activities will undoubtedly result in the production of a special handbook of engineering data for the use of fabricators and architects. Such information will be available for those outside as well as for the members of the association. Consideration of prices and labor problems will be avoided. The more commercial matters of the fabricating trade are in the hands of the Bridge Builders and Structural Society. Into the new organization it is hoped to enroll every fabricator in the country.

Pulverized Coal for Blast Furnace Plant

The Tennessee Coal, Iron & Railroad Co. has decided to use pulverized coal as a fuel for steam generation in conjunction with blast furnace gas on its new boiler installation at Ensley, Ala. The Fuller Engineering Co., Allentown, Pa., will install the coal drying, pulverizing and conveying systems and burners and feeders for five 834-hp. Stirling boilers designed to operate at 200 per cent of rating.

The pulverized coal equipment comprises the following: One 5x42 ft. indirect fired rotary coal dryer using blast furnace gas as a fuel. Two 46-in. Fuller-Lehigh gear driven, screen type pulverizer mills, direct connected to motors. A Fuller-Kinyon pulverized coal transport system, together with five take-off valves and six bin indicators, and 25 feeders and 25 vertical burners.

The boilers will be situated approximately 600 ft. from the pulverizing plant and the fuel will be conveyed directly from the pulverizer to the boiler bins. The fuel will be diverted from the main line to the individual service bins through distributing valves and branch lines.

CANADIAN BRIDGE PROJECTS

Projects for Current Year Involve 3500 Tons—
Japan Active—Chinese Buying Sporadic

NEW YORK, April 11.—The export market is still active in transactions with Japan, but activity in the Chinese market is sporadic. Demand by China for wire shorts is well sustained, but on second hand plates, shapes and bars it is sometimes difficult to interest buyers, even at low quotations. South American buying is unchanged, being small but steady.

The coal strike may possibly add one more burden to export trade. The leading independent export company has notified its Japanese representatives not to make firm offers on any material until the inquiry has been forwarded to the United States. While sheets and bars continue to show a fair activity, some other materials have fallen off considerably in business with Japan. One exporter in New York is offering several hundred tons of wire rods, wire and nails, some items at the market price and others below current quotations.

Improvement is noted in Japan in the pig iron situation. Against stocks of about 400,000 tons of pig iron in that country one year ago, there is an estimated total to-day of about 200,000 tons. Prices show considerably more stiffness, but quotations on Japanese domestic iron are still below the price on imported irons from China, India and the United States. The current quotation on No. 1 Hanyang iron in the Tokio market is about 68 yen per ton.

It is reported from South Africa that a new electric furnace, capacity 500 tons per month, has been installed at the Union Steel Corporation's Vereeniging works. A bill is now before the Australian legislature providing for the addition of £4,000,000 to the state railroads' capital debt, the money to be applied upon the construction of the bridge at Sydney, New South Wales, for which tenders are being received until Oct. 31, of this year.

It is estimated that bridge construction in Canada during the present year will involve the use of about 3500 net tons of structural steel. These bridge projects include the Drummondville bridge, 421 ft. long, 2 spans; East Angus Bridge, double decked with steel approach; St. Alexis Bridge, 340 ft. long; St. Stanislas Bridge, 510 ft. long, 3 spans; Isles Perrot Bridge, 2 bridges joining Perrot Islands; Shipshaw Bridge, 500 ft. long over Saguenay River, cantilever type; St. Raymond Bridge, 240 ft. long.

The two railroad projects for this year, one of which is under construction, are a section of the Interprovincial and James Bay Railway, 70 miles of 56-lb. rails and a new section of the Quebec-Chibougamou Railway from Chicoutimi to St. Felicien requiring about 120 miles of 100-lb. rails. It is estimated that school construction in Canada projected for this year will be large.

Engineers' Papers at Atlanta

Among the papers to be presented at the spring meeting of the American Society of Mechanical Engineers at Atlanta, May 8 to 11, are the following:

"Material Handling Equipment as Used in the Iron and Steel Industry," by Frank L. Leach, Perin & Marshall, New York.

"Reduction of Fuel Wastes in the Steel Industry," by Frank G. Cutler, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

"The Control of Boiler Operation," by Edward A. Uehling, Milwaukee.

"Boiler-Room Performance and Practice at Colfax Station, Duquesne Light Co.," by C. W. E. Clarke, Dwight P. Robinson & Co., New York.

"Centrifugal Castings," by Leon Cammen.

"Insulation Losses from Pipe Coverings," by Russell H. Heilman, Mellon Institute, Pittsburgh.

"Steel for Forge Welding," by Frank N. Speller, National Tube Co., Pittsburgh.

"Tests on Welded Cylinders," by Edwin A. Fessenden and Louis J. Bradford, State College, Pa. (Under auspices A. S. M. E. Boiler Code Committee and American Welding Society.)

Corporation's Unfilled Orders Increased in March

The unfilled business on the books of the United States Steel Corporation as of March 31 last, amounted to 4,494,148 tons, or 353,079 tons more than reported on the books Feb. 28. In February the unfilled orders decreased 100,609 tons, and in January 26,736 tons, while in December they increased 17,872 tons. Last November and October there were decreases of 35,287 and 273,841 tons, respectively; in September an increase of 28,744 tons, and then a series of decreases each month from August, 1920. A year ago the unfilled business amounted to 6,284,765 tons, or 1,790,617 tons more than on the books March 31 last. The monthly unfilled tonnage since January, 1920, compares as follows:

	1922	1921	1920	1919
Jan. 31.....	4,241,678	7,573,164	9,285,441	6,684,268
Feb. 28.....	4,141,069	6,933,867	9,502,081	6,010,787
Mar. 31.....	4,494,148	6,284,765	9,892,075	5,430,572
Apr. 30.....	5,845,224	10,359,747	7,800,685	
May 31.....	5,482,487	10,940,465	4,282,310	
June 30.....	5,117,868	10,978,817	4,892,855	
July 31.....	4,830,324	11,118,468	5,578,661	
Aug. 31.....	4,531,926	10,805,038	6,109,102	
Sept. 30.....	4,560,670	10,374,804	6,284,638	
Oct. 31.....	4,286,829	9,836,862	5,472,668	
Nov. 30.....	4,250,542	9,021,481	7,128,330	
Dec. 31.....	4,268,414	8,148,122	8,265,366	

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

COMING MEETINGS

April

National Metal Trades Association. April 19 and 20. Annual meeting, Hotel Astor, New York. Secretary, Louis W. Fischer, Peoples Gas Building, Chicago.

American Gear Manufacturers' Association. April 20, 21 and 22. Annual meeting, Hotel Lafayette, Buffalo. Secretary, F. D. Hamlin, 4401 Germantown Avenue, Philadelphia.

American Supply and Machinery Manufacturers' Association and Southern Supply & Machinery Dealers' Association. Joint meeting, April 24 to 26, Birmingham. F. D. Mitchell, 233 Broadway, New York, is secretary of the American association and A. M. Smith, Smith-Courtney Co., Richmond, Va., is secretary of the Southern association.

National Machine Tool Builders' Association. April 25 and 26. Spring convention, Hotel Traymore, Atlantic City, N. J. General manager, E. F. DuBrul, 817 Provident Bank Building, Cincinnati.

Society of Industrial Engineers. April 26 to 28. Spring meeting, Hotel Statler, Detroit. George C. Dent, business manager, 327 S. La Salle Street, Chicago.

American Electrochemical Society. April 27 to 29. Spring meeting, Baltimore. Acting secretary, Dr. Conlin G. Fink, 101 Park Avenue, New York.

May

Iron and Steel Institute. May 4 and 5. Annual Meeting, Quarters of Institution of Civil Engineers, London, England. Secretary, George C. Lloyd, 28 Victoria Street, S. W. London.

The National Supply and Machinery Dealers' Association. May 8, 9 and 10. Seventeenth annual convention, Marlborough-Blenheim Hotel, Atlantic City. Secretary, T. James Fernley, 505 Arch Street, Philadelphia.

American Society of Mechanical Engineers. May 8 to 10. Spring meeting, Atlanta, Ga. Secretary, Calvin W. Rice, 29 West Thirty-ninth Street, New York.

National Association of Manufacturers. May 8, 9 and 10. Annual Convention, Waldorf-Astoria Hotel, New York. General offices, 50 Church Street, New York.

National Foreign Trade Council. May 10 to 12. Convention Hall, Philadelphia. Secretary, O. K. Davis, 1 Hanover Square, New York.

National Sheet Metal Contractors' Association. May 15 to 19. Convention and exposition, Cadle Tabernacle, Indianapolis.

National Association of Purchasing Agents. May 15 to 20. Annual convention and exposition, Exposition Park, Rochester, N. Y. Secretary, H. R. Heydon, 19 Park Place, New York.

American Iron, Steel & Heavy Hardware Association. May 23 to 25. Annual meeting, Hotel Washington, Washington. Secretary, A. H. Chamberlain, Marbridge Building, New York.

PRODUCTION OF RAILS IN 1921

Bessemer Declines to Only 96,039 Tons — Little Alloy-Treated Steel

Production of rails in the United States in 1921, according to a bulletin of the American Iron and Steel Institute, amounted to 2,178,818 gross tons compared

respondent estimates the number idle directly because of the strike at around 15,000. The union claims undoubtedly include several thousand men who have had no work for some months because of the general business depression.

The spread of the strike into the northern field followed a mass meeting in Uniontown Sunday afternoon, attended by some 3000 men of whom 1000 to 1500 sig-

Kinds	Production of Rails by Weights and Processes, 1921		Total			
	Under 50 Lb.	50 to 84 Lb.		85 to 99 Lb.	100 Lb. and Over	Gross Tons
Open-hearth	128,401	60.69	184,030	85.62	867,482	96.09
Bessemer	21,856	10.33	29,478	13.72	1,961	0.22
Other	61,311	28.98	1,428	0.66	33,305	3.69
Total	211,568	100.00	214,936	100.00	902,748	100.00
					849,566	100.00
					100.00	100.00

with 2,604,116 tons in 1920. The decrease was largest in Bessemer, it being 61.12 per cent, while the de-

Production of Rails by Processes, Gross Tons

Years	Open-Hearth	Bessemer	Rerolled*	Elec.	Iron	Total
1907	252,704	3,380,025	...	...	925	3,633,654
1908	571,791	1,349,153	...	...	71	1,921,015
1909	1,256,674	1,767,171	...	+	...	3,023,845
1910	1,751,359	1,884,442	...	+	230	3,636,031
1911	1,676,923	1,053,420	91,751	462	234	2,822,790
1912	2,195,144	1,099,926	119,390	3,435	...	3,327,915
1913	2,527,710	817,591	155,043	2,436	...	3,502,780
1914	1,525,851	323,897	95,169	178	...	1,945,095
1915	1,775,168	326,952	102,083	...	...	2,204,203
1916	2,269,600	440,692	144,826	...	...	2,854,518
1917	2,292,197	533,325	118,639	...	...	2,944,161
1918	1,945,443	494,193	101,256	...	...	2,540,892
1919	1,893,250	214,121	96,422	50	...	2,203,843
1920	2,334,222	142,899	126,698	297	...	2,604,116
1921	2,027,215	55,559	96,039	5	...	2,178,818

*Rerolled from old steel rails. Included with Bessemer and open-hearth steel rails from 1907 to 1910 inclusive.

†Small tonnages rolled in 1909 and 1910, but included with Bessemer and open-hearth rails for these years.

crease in open-hearth was only 13.15 per cent. The production of Bessemer rails was only 96,039 tons. The

Production of Rails, Showing Decrease by Processes, 1920-1921

Kinds	1920	Per Cent	1921	Per Cent	Decrease	Per Cent
Open-hearth	2,334,222	89.63	2,027,215	93.04	307,007	13.15
Bessemer	142,899	5.49	55,559	2.55	87,340	61.12
All other	126,995	4.88	96,044	4.41	30,951	24.37
Total	2,604,116	100.00	2,178,818	100.00	425,298	16.33

production of alloy-treated steel rails in 1921 amounted to only 6276 tons compared with 12,909 tons in 1920.

The Strike in the Connellsville Region

UNIONTOWN, PA., April 11.—Union organizers have succeeded beyond expectations in tying up mines in the unorganized Connellsville bituminous region. The Southern Connellsville field is almost completely tied up, including the Frick Coke Co. plants from which by-product coal was being shipped to the Clairton by-product plants of the Steel Corporation.

To-day and yesterday the first real "invasion" of the northern Connellsville field was begun when six big Frick plants, three Oliver and Snyder Steel Co. plants and the Keister plant were suspended. The Frick plants affected in the northern Connellsville field are Leith, Phillip, Redstone, Yorkrun, Crossland and Continental No. 2. Three Oliver plants are idle.

The Leisenrings, stronghold of the Frick company, in the heart of the old Klondike region, are still operating and production is increasing. It is believed by observers that the peak has been reached in the spread of the union organization. They believe this from the fact that the Leisenrings have not been affected by the strike and the men there say they will continue to work.

Approximately 50 plants in the Connellsville bituminous field are idle to-day. Union leaders claim 30,000 men are idle because of the strike. Operators maintain the number is around 10,000. Your cor-

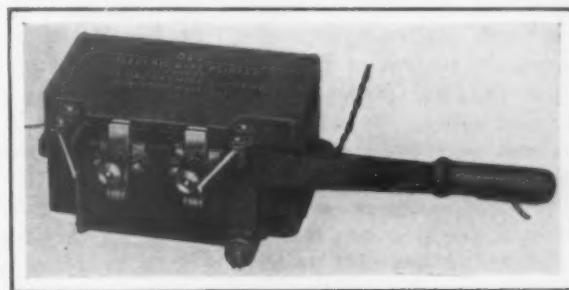
nified their allegiance to the Mine Workers' Union.

The next ten days will see how effective the union organization in this region really is. Most observers are of the opinion that the swing of the pendulum back to work will start within that time and that the mass psychology which they claim was largely responsible for the spread of the walkouts will operate just as effectively in the return to the places in the mines. It is also pointed out that several hundred Frick employees are shareholders in the Steel Corporation.

The Frick company will lead the operators of the region in fighting the strike. The beginning has been made by the publication of advertisements here calling attention to the Union scale in Kentucky and the operation of the workmen's compensation law. An unprecedented thing has been done by the Frick company in opening news headquarters here. Reports that an increased wage scale is imminent are denied emphatically by all operators. Reports that miners are to be evicted from their homes this week upon refusal to return to work also are denied. There has been no disorder of any kind during the strike.

A New Wire Pointing Attachment

In THE IRON AGE of Feb. 9, on page 417, was illustrated a resistance wire pointing device forming part of the new continuous wire drawing machine placed on the market by the O. & J. Machine Co., Worcester, Mass. A new form of pointing device, here illustrated, has now been perfected, for use either in the machine



Wire Clamped Between the Terminals Is Heated Electrically and Then Extended, by Action of the Lever, to Make the Point as It Breaks

previously described or for separate use in connection with wire drawing benches of the ordinary type.

Both devices have been designed for pointing wires for insertion in the drawing dies. Depending on the size of the wire, the new type will make a point in 10 sec. or less, the full time being required for its maximum capacity of 3/32 in. diameter. Either high or low carbon wires may be pointed. The device is operated from an alternating current lamp circuit of either 110 or 220 volts. The handle is used to stretch out the wire after it becomes heated between the clamps. This produces a conoidal point, which may be inserted easily into the drawing die.

Work has commenced at Youngstown, Ohio, on erection of the initial unit of a plant to be established by the Paul J. Kalman Co., Chicago, fabricator of reinforcing bars.

Manganese Ores Are Put on the Free List

Ferromanganese Duty Reduced in Senate Bill to \$2.50 Per Ton— Ferrotungsten and High Speed Steel Specific Duties Lower Than House Rates, but Ad Valorem Rates Raised

WASHINGTON, April 11.—Reported to the Senate late to-day from the Finance Committee, which has been considering it since last July, the permanent tariff bill carries important changes in the metal schedule as it passed the House. Mainly these relate to manganese ores, ferroalloys and tool steel. On the heavier products such changes as have been made have been comparatively slight. But the fact that the Senate bill places ad valorem duties on a foreign valuation basis, as against the American valuation basis carried in the House bill, makes a far different measure from that which came from the House, and it may be expected that this feature will be the object of a vigorous contest between the House and the Senate before the bill finally is enacted into law. There are provisions in the Senate bill, however, which call for flexible tariffs, by variations in the basis of assessing duties, and these may lessen the differences between the two branches of Congress. In many instances the Senate bill, being based on foreign valuations, carries higher ad valorem duties than the House bill, the increases being from 30 to 50 per cent.

Manganese Ore Free. Ferromanganese \$2.50

The most notable changes made in the metal schedule by the Senate committee followed many conferences between men in industry and members of the committee. Manganese ore has been made free, as it is to-day. Ferromanganese has been reclassified and given a duty of only \$2.50 when containing more than 1 per cent of carbon and 30 per cent or more manganese, with duty of 20 per cent ad valorem when containing not more than 1 per cent carbon. The House bill carried a duty of 2 1/5c. per lb. on the manganese content of ferromanganese when containing 45 per cent manganese or more and more than 1 per cent carbon. It carried this same duty, plus 28 per cent ad valorem, when containing not more than 1 per cent carbon. Pig iron was left at \$1.25 per ton, as provided in the House bill, but it is said the committee at one time was seriously considering the idea of increasing this duty to \$2.50. With 30 per cent established as the dividing line on alloys containing manganese, as compared with 45 per cent in the House bill, spiegeleisen is made dutiable at \$1.25 per ton, when containing more than 1 per cent carbon and less than 30 per cent manganese, while when containing not more than 1 per cent carbon it carries a duty of 20 per cent ad valorem. The House bill duties on spiegeleisen, with the difference noted as to the dividing line on manganese, were \$1.25 per ton on the higher carbon and 2 1/5c. per lb., plus 28 per cent ad valorem where carbon is not more than 1 per cent.

Ferrosilicon has been reclassified as to silicon content, the basis of fixing duties, provision being made for four grades, 8 to 60 per cent, dutiable at 2c. per lb.; 60 to 80 per cent, dutiable at 3c. per lb.; 80 to 90 per cent, dutiable at 4c. per lb., and 90 per cent or more, dutiable at 8c. per lb. The House bill divisions were 8 to 30 per cent, dutiable at 2 1/2c. per lb.; 30 to 60 per cent, dutiable at 2 3/4c. per lb.; 60 to 80 per cent, dutiable at 3 1/5c. per lb.; 80 to 90 per cent, dutiable

at 4c. per lb., and 90 per cent or more, dutiable at 8c. per lb.

Changes in High Speed Steels and Alloys

Changes the Senate committee made in molybdenum and tungsten ore, ferromolybdenum, ferrotungsten, and ferrochrome and tool steel, were explained in *THE IRON AGE* of last week to a large extent. As will be seen in the accompanying table, ferromolybdenum has been reduced by the Senate to \$1 per lb. and 15 per cent ad valorem, as compared with \$1.25 per lb. and 17 per cent ad valorem in the House bill. Ferrotungsten has been reduced to 60c. per lb. and 25 per cent ad valorem, as compared with 72c. per lb. and 15 per cent ad valorem. The same change is made in high speed steel. Ferrochrome was left unchanged at 3 1/2c. per lb. Zirconium ferrosilicon has been added to the metal schedule, and along with ferrovanadium, zirconium, vanadium, nickel, ferrotitanium and other alloys in a similar class, has been left dutiable at 30 per cent, while cerium metal, made dutiable at \$2 per lb., and ferrocerium and other cerium alloys, made dutiable at \$2 per lb. and 25 per cent ad valorem, have been separated.

Ingots, blooms, billets, etc., have been left unchanged by the Senate at rates ranging from 2/10c. per lb. to 25 per cent ad valorem, according to their value per lb. The same is true of boiler and other plates and skelp, except that the Senate bill, in leaving the duty at 7/20c. per lb. on plates and skelp valued at 1c. per lb. or less, changed the thickness to 109/1000-in. as compared with the House provision for 140/1000. Black sheets and galvanized sheets, bars, etc., have been left unchanged, as has structural steel not assembled, while machined and fabricated structural steel has been made dutiable at 30 per cent by the Senate, as compared with 25 per cent provided by the House. These are sharp reductions, as in case of other similar changes in ad valorem duties, when calculated on a foreign valuation.

Cotton Ties Back on Free List

Cotton ties, on which the House bill puts a duty of 3/4c. per lb., have been put on the free list, while cast iron pipe is made dutiable at 20 per cent, as compared with 10 per cent in the House bill. Welded pipe has been left unchanged, despite strong arguments made by steel producers to change the classification, and in certain instances lower the duties, while increasing them in others. Barbed wire has been left free, also, in the face of arguments that it is as deserving of a duty as other wire, but it is to be said that the influence of the agricultural bloc was shown in this instance, as is true in many portions of the bill. The only item in agricultural implements removed from the free list relates to lawn mowers. Steel rails were left dutiable at 1/4c. per lb.

Magnesite Duties Reduced

Magnesite was changed to the duties reported previously by *THE IRON AGE* at 5/16c. per lb. for crude and 4/10c. per lb. for grain, as compared with House duties of 1/2c. and 3/4c. per lb. These, along with a number of other items, it is already indicated, will be

subjects of much controversy in conference if no change is made in the Senate, as domestic magnesite and refractories producers are urgently contending they need higher duties as a matter of protection, while steel interests have just as strongly argued for lower duties on this item, as well as on manganese ore, ferromanganese and fluorspar. The duty on the latter, however, was increased to \$5.60 per ton from \$5 per ton. Pig tin and bars were changed to the free list, whereas a duty of 2c. per lb. was carried in the House bill. Duties in the House bill on zinc and lead ore were left unchanged.

The Senate committee rewrote the paragraph relating to muck bars and bar irons and gave a more specific phraseology in accordance with trade practice, but made only small changes, which are upward. The paragraph covers muck bars, bar iron, and round iron, in coils or rods, iron in slabs, loops or other forms less finished than iron in bars and more advanced than pig iron, except castings, and the duties are as follows: Valued at not over 1c. per lb., 2/10c. per lb.; valued above 1c. per lb. and not above 1½c. per lb., 3/10c. per lb.; valued above 1½c. per lb. and not above 2½c. per lb., 5/10c. per lb.; valued above 2½c. and not above 3½c. per lb., 8/10c. per lb.; valued above 3½c. per lb. and not above 5c. per lb., 1c. per lb.; valued

above 5c. per lb., 1½c. per lb. Sashes, frames and building forms have been given a separate place in the structural paragraph and made dutiable at 40 per cent ad valorem. Sewing machines, cash registers and printing presses have been removed from the free list and placed with lawn mowers in the dutiable list. Sewing machines valued at not more than \$75 have been given a duty of 25 per cent ad valorem, and those valued at more than \$75 made dutiable at 40 per cent. Cash registers have been made dutiable at 25 per cent ad valorem. Printing presses, not specially provided for, are in this same group, along with machine tools, and made dutiable at 35 per cent ad valorem. The House bill duty on machine tools is also 35 per cent. Chrome ore is left on the free list. Cutlery, clocks, watches, etc., have been given increased duties.

President May Substitute American Valuation

The provision in the Senate bill for assessing ad valorem duties on a foreign valuation basis has what might be termed a number of "saving" clauses. The bill calls for such duties on "foreign value or the export value, whichever is higher." Authority then is given to the President upon his own initiative, after investigation, where necessary, through the Treasury Department, to transfer from the foreign valuation to

Comparison of Tariff Rates

	Senate Bill	House Bill	Present Act	Payne-Aldrich Act
Iron ore	Free	Free	Free	Free
Pig iron	\$1.25 ton	\$1.25 ton	Free	\$2.50 ton
Scrap	\$1 ton	\$1.25 ton	Free	\$1 ton
Spiegeleisen	\$1.25 ton when more than 1 per cent carbon and less than 30 per cent Mn. 20 per cent ad valorem when less than 1 per cent carbon and not more than 30 per cent Mn.	\$1.25 ton when more than 1 per cent carbon and less than 45 per cent Mn. 2½c. lb. on Mn. when 45 per cent or more Mn. and not more than 1 per cent carbon	Free	\$2.50 ton
Ferromanganese	\$2.50 ton when more than 1 per cent carbon and 30 per cent or more Mn. 20 per cent ad valorem content when less than 1 per cent carbon and 30 per cent or more Mn.	2½c. lb. on Mn. content if more than 1 per cent carbon and 45 per cent or more Mn. 2½c. lb. and 28 per cent ad valorem when less than 1 per cent carbon and 45 per cent or more Mn.	Free	\$2.50 ton
Manganese ore	Free	1c. lb. on Mn. content when over 30 per cent Mn.	Free	Free
Ferrosilicon (on silicon content)	2c. lb.; 8 to 60 per cent 3c. lb.; 60 to 80 per cent 4c. lb.; 80 to 90 per cent 8c. lb.; 90 per cent or more	2½c. lb.; 8 to 30 per cent 2½c. lb.; 30 to 60 per cent 3½c. lb.; 60 to 80 per cent 4c. lb.; 80 to 90 per cent 8c. lb.; 90 per cent or more	15 per cent	20 to 25 per cent
Molybdenum ore (on metallic molybdenum content)	75c. lb.	75c. lb.	Free	Free
Tungsten ore (on metallic tungsten)	45c. lb.	45c. lb.	Free	10 per cent
Ferromolybdenum (on molybdenum)	\$1 lb. and 15 per cent ad valorem	\$1.25 lb. and 17 per cent ad valorem	15 per cent	20 to 25 per cent
Ferrotungsten, metallic tungsten and compounds (on tungsten)	60c. lb. and 25 per cent ad valorem	72c. lb. and 15 per cent ad valorem	15 per cent	20 to 25 per cent
Ferrochromium tungsten, chromium tungsten, chromium cobalt tungsten, tungsten nickel and other alloys of tungsten not provided for	60c. lb. and 25 per cent ad valorem	72c. lb. and 17 per cent ad valorem	15 per cent	20 to 25 per cent
Ferrochrome, 3 per cent or more carbon (on chromium content)....	3½c. lb.	3½c. lb.	15 per cent	20 to 25 per cent
Ferrochrome, less than 3 per cent carbon and chrome metal	30 per cent ad valorem	30 per cent ad valorem	15 per cent	20 to 25 per cent

	<i>Senate Bill</i>	<i>House Bill</i>	<i>Present Act</i>	<i>Payne-Aldrich Act</i>
Steel ingots, blooms, slabs, billets, iron-molded steel castings, sheets and plates not specially provided for, value not over				
1c. lb. 2/10c. lb.	2/10c. lb.			
1c. to 1 1/2c. lb. 3/10c. lb.	3/10c. lb.			
1 1/2c. to 2 1/2c. lb. 5/10c. lb.	5/10c. lb.			
2 1/2c. to 3 1/2c. lb. 8/10c. lb.	8/10c. lb.			
3 1/2c. to 5c. lb. 1c. lb.	1c. lb.			
5c. to 8c. lb. 1 7/10c. lb.	1 1/2c. lb.			
8c. to 12c. lb. 2 1/2c. lb.	2c. lb.			
12c. to 16c. lb. 3 1/2c. lb.	2 1/2c. lb.			
16c. to 20c. lb.		4c. lb. to 20 per cent		
16c. lb. or more.... 25 per cent ad valorem				
Circular saw plates.... Additional duty of 1/4c. lb.		Additional duty of 1/4c. lb.		
Boiler or other plate iron or steel, except crucible plate steel and saw plate steel, not thinner than 109/1000 in., and skelp valued at				
1c. lb. or less.... 7/20c. lb.	7/20c. lb. on plates of kind named not thinner than 140/1000 in.	12 per cent	20 per cent	
1c. to 3c. lb. 5/10c. lb.	5/10c. lb.	12 per cent	20 per cent	
Over 3c. lb. 20 per cent	20 per cent	12 per cent	20 per cent	
Black iron and steel sheets, skelp iron or steel valued 3c. lb. or less:				
From 109/1000 in.... 45/100c. lb.	45/100c. lb.			
From 38/1000 to 22/1000 in.... 55/100c. lb.	55/100c. lb.			
From 22/1000 in. to 10/1000 in.... 75/100c. lb.	75/100c. lb.			
Thinner than 10/1000 in. 85/100c. lb.	85/100c. lb.			
Corrugated or crimped.... 75/100c. lb.	75/100c. lb.			
Foregoing valued at more than 3c. lb.... 20 per cent		20 per cent		
Galvanized sheets, plates, bars (for galvanizing).... 2 1/10c. lb. extra	2/10c. lb. extra	15 per cent	2/10c. lb. extra	
Tin plate and terne plate, 1c. lb.	1 1/10c. lb.		1 2/10c. lb.	
Structural, not assembled. Value, 9/10c. lb or less.... 7/20c. lb.	7/20c. lb.	10 per cent	3/10c. to 4/10c. lb.	
Machined and fabricated.... 30 per cent	25 per cent	10 per cent	45 per cent	
Hoop, band and scroll iron and steel not specially provided for, Value, 3c. lb. or less, 8/10 in. or less in width, from 3/8 to 109/1000 in. thick 25/100c. lb.	25/100c. lb.	10 per cent	3/10c. lb.	
109/1000 to 38/1000 in.... 35/100c. lb.	35/100c. lb.	10 per cent	4/10c. lb.	
Thinner than 38/1000 in.... 55/100c. lb.	55/100c. lb.	10 per cent	6/10c. lb.	
Bands and strips not specially provided for, long or short lengths.... 35 per cent	20 per cent	10 per cent	35 per cent	
Cotton ties 1/4c. lb.	1/4c. lb.	Free	3/10c. lb.	
Wire rods. Value not over 4c. lb. 3/10c. lb.	3/10c. lb.	10 per cent	3/10c. lb.	
Value over 4c. lb.... 6/10c. lb.	6/10c. lb.	10 per cent	6/10c. lb.	
Same rates in House and Senate bills on wire rods specially treated, cold drawn, hammered, etc.				
Barbed wire Free	Free	Free	Free	
Round iron or steel wire:				
Not smaller than 95/1000 in. diam.... 3/4c. lb.	3/4c. lb.		1c. lb.	
From 95/1000 to 65/1000 in.... 1 1/4c. lb.	1 1/4c. lb.		1 1/4c. lb.	
Smaller than 65/1000 in.... 1 1/2c. lb.	1 1/2c. lb.	15 per cent	1 3/4c. lb.	
Galvanized wire (extra).... 2/10c. lb.	2/10c. lb.		35 per cent	
Iron, steel anchors, iron, steel forgings not machined, tooled, etc.... 30 per cent	25 per cent	12 per cent	30 per cent	
Ball bearings and rollers.... 10c. lb. and 55 per cent	10c. lb. and 35 per cent	35 per cent	45 per cent	
Railway fishplates, splice bars 1/4c. lb.	1/4c. lb.	10 per cent	3/10c. lb.	
Steel rails 7/40c. lb.	7/40c. lb.	Free	7/40c. lb.	
Axes, bars, blanks, forgings. Value not over 6c. lb. 6/10c. lb.	6/10c. lb.	10 per cent	8/4c. lb.	
Cast iron pipe.... 20 per cent	10 per cent	10 per cent	1/4c. lb.	
Lap and butt weld pipe, tubes, etc., not thinner than 65/1000 in.:				
Not less than 3/8 in. diam.... 3/4c. lb.	3/4c. lb.		1c. lb.	
From 3/8 to 1/4 in.... 1 1/4c. lb.	1 1/4c. lb.		1 1/4c. lb.	
Not less than 1/4 in.... 1 3/4c. lb.	1 3/4c. lb.	20 per cent	2c. lb.	

<i>Senate Bill</i>	<i>House Bill</i>	<i>Present Act</i>	<i>Payne-Aldrich Act</i>
Iron and steel chain not less than $\frac{3}{4}$ in. diam. 1c. lb. From $\frac{3}{4}$ to $\frac{5}{8}$ in. $1\frac{1}{4}$ c. lb. From $\frac{5}{8}$ to $\frac{1}{2}$ in. $2\frac{1}{4}$ c. lb. Less than $\frac{1}{2}$ in. 4c. lb.	1c. lb. $1\frac{1}{4}$ c. lb. $2\frac{1}{4}$ c. lb. 4c. lb.	25 per cent	$\frac{7}{8}$ c. lb. $1\frac{1}{2}$ c. lb. $1\frac{6}{8}$ c. lb. 3c. lb.
Nuts, washers of wrought iron, steel 6.10c. lb.	6/10c. lb.	5 per cent	$\frac{3}{4}$ c. lb.
Bolts and bolt blanks.... 1c. lb.	1c. lb.	10 per cent	$1\frac{1}{2}$ c. lb.
Cut nails and spikes: Over 2 in. long. 4/10c. lb. Under 2 in., including tacks 30 per cent	4/10c. lb. 20 per cent	Free	4/10c. lb.
Brackets, studs, etc..... 40 per cent	25 per cent	20 per cent	45 per cent
Steel wool 10c. lb.	10c. lb.	20 per cent	40 per cent
Wood screws: Over 2 in. long. 3c. lb. From 1 to 2 in. 5c. lb. From $\frac{1}{2}$ to 1 in. 8c. lb. $\frac{1}{2}$ in. or less. 10c. lb.	10c. per gross 8c. per gross 5c. per gross 3c. per gross	25 per cent	3c. lb. 5c. lb. 8c. lb. 10c. lb.
Scientific instruments ... 55 per cent	40 per cent	20 per cent	45 per cent
Machine tools and parts. 35 per cent	35 per cent	15 per cent	30 per cent
Aluminum, scrap and alloys 5c. lb.	5c. lb.	2c. lb.	7c. lb.
Copper in rolls, rods, sheets $2\frac{1}{2}$ c. lb.	$2\frac{1}{2}$ c. lb.	5 per cent	$2\frac{1}{2}$ c. lb.
Brass rods, sheets, plates, etc. 4c. lb.	4c. lb.	20 per cent	45 per cent
Tin in bars, blocks or pigs. Free	2c. lb.	Free	Free
Lead-bearing ores $1\frac{1}{2}$ c. lb. lead content	$1\frac{1}{2}$ c. lb. lead content	$\frac{3}{4}$ c. lb.	$1\frac{1}{2}$ c. lb. lead cont.
Zinc-bearing ore: Less than 10 per cent zinc Free From 10 to 20 per cent zinc $\frac{1}{2}$ c. lb. zinc content From 20 to 25 per cent zinc 1c. lb. zinc content Over 25 per cent zinc. $1\frac{1}{2}$ c. lb. zinc content	Free $\frac{1}{2}$ c. lb. zinc content 1c. lb. zinc content $1\frac{1}{2}$ c. lb. zinc content	Free	Free $\frac{1}{2}$ c. lb. zinc cont. $1\frac{1}{2}$ c. lb. zinc cont. 1c. lb. zinc cont.
Magnesite, crude $\frac{1}{2}$ c. lb. Dead-burned 4/10c. lb.	$\frac{1}{2}$ c. lb. $\frac{3}{4}$ c. lb.	Free Free	Free Free
Fluorspar \$5.60 ton	\$5 ton	Free	\$3 ton
Graphite, crude or refined Amorphous 10 per cent Crystalline lump, chip, dust 20 per cent Crystalline flake 2c. lb.	10 per cent	Free	Free

the American wholesale selling price of the imported products. He also is empowered to make flexible rates and may decrease or increase duties 50 per cent in order to meet any unusual circumstances that may arise. Moreover, the bill empowers him to prohibit entirely imports sent through cartels or associations which are endeavoring to control prices within the United States. The retaliatory clause was eliminated by the Senate committee, but in this connection the President again is given authority not heretofore given the Chief Executive, and where there is undue discrimination against exports from the United States, the President by proclamation may provide for duties where there are none and increased duties where necessary on like products from other countries when coming to the United States.

Contentions of Committee Majority

WASHINGTON, April 11.—Commenting on the metal schedule in the tariff bill submitted to the Senate this afternoon by Chairman McCumber of the Finance Committee, the majority members in their report state that the general policy of adjusting rates on raw materials to protect the domestic mining industries without inflicting undue hardship on the consuming interests was followed throughout the schedule.

The rate on tungsten ore in the House bill was retained, it is pointed out, but the specific rate on ferrotungsten was reduced, to permit a differential allowance for the losses suffered by the manufacturer of high-speed steel at the same time protecting the ferro-alloy manufacturer.

The transfer of manganese ore to the free list is cited as a further illustration of this policy. Data as to domestic resources, the report states, have been prepared by the Geological Survey and the Tariff Com-

mission, and their evidence upholds the conclusion that the domestic resources of manganese ore are insufficient in quantity to provide adequate supplies of this important metal for any considerable period. Rates on ferrosilicon are slightly reduced, it is asserted, but they should still afford fair protection to the domestic producers.

The report states that the most important change in the tariff treatment of non-ferrous metals is the transfer of tin metal back to the free list. In the lead ore paragraph, it is stated, the phraseology has been changed to conform with the present practice, which permits free entry of somewhat more than 20 lb. per ton of the lead content of imported ore. While this was avoided in the phraseology of the House bill, the latter placed the bonded smelting interests at some disadvantage, the report states, as compared with non-bonded works in view of existing Treasury regulations.

Discussing magnesite, the report states it was transferred from the chemical schedule to the schedule on earths, earthenware and glassware, "where it properly belongs." It is stated that a careful study was made of the cost of producing dead burned or refractory magnesite in the United States and in Central Europe. The rate of 0.4 cent per pound is declared to be designed to place the domestic product on an equal basis with the imported material in the chief steel producing centers of this country.

American valuation is treated as an emergency measure for the purpose of meeting unusual conditions which may arise. Penalizing of discriminations against American commerce has been provided as a substitute for House provisions regarding reciprocity and penalty duties. These latter are declared to be contrary to the policy of equality of opportunity and the principle of the open door, which the State Department has been consistently urging. Briefly disturbed economic conditions are offered as the chief reason for retaining the foreign valuation basis with the safeguards mentioned.

Iron and Steel Markets

COAL STRIKE A FACTOR

Closing of Non-Union Mines Causes a Flurry in Iron and Steel

Pig Iron Advanced and Finished Steel Situation Stronger

The coal strike has become a factor in the iron and steel market to a far greater extent than was deemed likely one week ago. The stoppage of mining in non-union fields, and particularly in the Connellsville region, has gone to the point of causing the banking of a number of blast furnaces in Ohio and the Pittsburgh District, and plans announced recently for starting other furnaces are in abeyance.

Already advances in pig iron have been made at several centers, amounting in the East to \$1 per ton, and the possibility of a temporary scarcity has entered into the calculations of some producers and a good many consumers. In finished steel products, while no general price advances are traceable to the coal strike, the restriction of the non-union output of coal has stiffened all markets and led some steel companies to stop selling.

The week has brought a large volume of new business to the mills, a good part of it the closing of options recently given, but some of it also due to the turn the fuel situation has taken. The Steel Corporation's March increase of 353,000 tons in unfilled orders was one evidence among several that the size of the present buying movement has been underestimated.

While more non-union workers than expected went out at Connellsville mines, relatively few have joined the union. Idleness just before Easter is not new, and it is agreed that next week will show more clearly the extent of the tieup.

Blast furnace stoppages include the putting out of two at Mingo Junction, Ohio, and the banking of a Schoenberger furnace at Pittsburgh and of one Haselton furnace near Youngstown. The starting of five Carnegie Steel Co. furnaces that had been planned is postponed. In the Cleveland and Youngstown and other districts bankings are a possibility.

In the Chicago district the Steel Corporation has an 80 per cent steel works operation this week, which is high point since the summer of 1920. At the opening of the week its Pittsburgh district steel works was running close to 70 per cent.

The steel ingot output in March, estimated at 2,815,000 tons, was at a 20 per cent higher rate than that of February, and represented nearly 32,500,000 tons per year, while the early April rate was nearer 34,000,000 tons per year.

The establishment of 1.50c., Pittsburgh, as the market for bars, plates and shapes has been helped by the coal strike. At Pittsburgh skelp has also gone to 1.50c. and that is now the basis also for light rails. In the advance of wire nails from \$2.40 to \$2.50, with a \$2 per ton higher price on wire products except plain and galvanized wire, the two or three independent producers making the move have not been followed by the Steel Corporation.

Fully 400,000 tons of steel will be required for railroad cars and locomotives placed within the past week or now pending. In addition to purchasing 16,000 cars, the New York Central is expected to provide for repairs to 30,000 cars. Locomotive orders include 40 for the New York Central, 25 for the St. Paul and 10 for the Burlington, and among locomotive inquiries are 100 for the Denver & Rio Grande, 28 for the Buffalo, Rochester & Pittsburgh and 5 for the Norfolk Southern. The Nickel Plate has bought 12,000 tons of rails and there are fresh orders from other lines.

Fabricated steel put on the books in the past week, not including the 23,000-ton bridge for the New York Central near Albany, represented 90 per cent of shop capacity.

Due partly to larger demand for castings, but more to a fear that the coal strike will curtail pig iron output, buying of foundry grades, especially in Eastern territory, has been very heavy and prices of Northern irons have been advanced fully \$1, while many furnaces have virtually withdrawn from the market, as they have large tonnages on their books. Southern iron also has been active and nearly all furnaces are quoting \$16, but the market has not been firm at that price. Basic has been active and one Eastern plate manufacturer has closed for nearly 20,000 tons, while 10,000 tons was placed at Cleveland. The purchaser may have to bank its own furnaces on account of the coal strike. Many smaller melters who delayed buying iron are having trouble in getting what they want.

An Eastern steel company has bought two cargoes of Swedish iron ore, which can be delivered at Atlantic port at considerably less than Lake Superior ore.

Increases in Philadelphia foundry iron and Valley basic iron have raised the pig iron composite price from \$18.47 to \$19.14, the highest figure since Dec. 13.

Increases in steel plates and black sheets have raised the finished steel composite price from 2.048c. to 2.084c., the highest figure since Dec. 20.

Pittsburgh

PITTSBURGH, April 11.

Strength in the iron and steel market, based upon the large demands of the past three or four weeks, has been intensified by the seriousness of the coal miners' strike as it pertains to the non-union fields, because the voluntary or involuntary failure of miners in the western Pennsylvania and West Virginia non-union fields to go to work already has begun to affect blast furnace and steel works operations in this and nearby districts. Although suspensions to date have not been numerous, plans of enlarged operations have had to be abandoned and it is probable that before the week ends a number of furnaces now making iron will be banked. In view of the fact that practically all of the large steel companies are showing extreme caution about adding to their obligations, and that delays now appear inevitable in the fulfillment of present commitments, the recurrence of runaway market conditions is a possibility. Such a development would not be welcomed and may well be avoided if those having orders in with the mills do not become panicky. Most manu-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 11, 1922	Apr. 4, 1922	Mar. 14, 1922	Apr. 12, 1921
No. 2X, Philadelphia‡	\$22.34	\$21.34	\$21.26	\$26.26
No. 2, Valley furnace‡	20.00	19.00	19.00	25.00
No. 2, Southern, Cin'ti‡	20.00	20.00	19.50	27.50
No. 2, Birmingham, Ala‡	15.50	15.50	15.00	23.00
No. 2 foundry, Chicago*	20.00	20.00	20.00	24.00
Bas. c. de'd, eastern Pa.	21.00	20.00	19.84	25.00
Basic, Valley furnace	19.00	18.00	18.00	23.00
Valley Bessemer, del. P'gh	21.96	21.46	21.46	26.96
Malleable, Chicago*	20.00	20.00	20.00	24.00
Malleable, Valley	19.50	19.00	19.00	25.00
Gray forge, Pittsburgh	21.71	20.71	20.71	25.96
S. charcoal, Chicago	26.00	26.00	26.00	38.50
Ferromanganese, seaboard	62.50	62.50	62.50	90.00

Rails, Billets, etc., Per Gross Ton:	Apr. 11, 1922	Apr. 4, 1922	Mar. 14, 1922	Apr. 12, 1921
0-h. rails, heavy, at mill	\$40.00	\$40.00	\$40.00	\$47.00
Bess. billets, Pittsburgh	29.50	29.50	28.00	38.00
0-h. billets, Pittsburgh	29.50	29.50	28.00	38.00
0-h. sheet bars, P'gh	31.00	31.00	29.00	38.00
Forging billets, base, P'gh	34.50	34.50	32.00	41.00
0-h. billets, Phila.	35.24	35.24	33.74	44.24
Wire rods, Pittsburgh	38.00	38.00	36.00	48.00
Skelp. gr. steel, P'gh, lb.	1.50	1.40	1.40	2.10
Light rails at mill	1.50	1.45	1.40	2.25

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.81	1.81	1.71	2.35
Iron bars, Chicago	1.60	1.60	1.55	2.38
Steel bars, Pittsburgh	1.50	1.50	1.40	2.00
Steel bars, Chicago	1.60	1.60	1.50	2.38
Steel bars, New York	1.88	1.88	1.78	2.38
Tank plates, Pittsburgh	1.50	1.40	1.40	2.00
Tank plates, Chicago	1.60	1.60	1.50	2.38
Tank plates, New York	1.78	1.78	1.78	2.38
Beams, Pittsburgh	1.50	1.50	1.40	2.00
Beams, Chicago	1.60	1.60	1.50	2.38
Beams, New York	1.88	1.88	1.78	2.38
Steel hoops, Pittsburgh	1.90	1.90	1.80	2.75

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, April 11, 1922, Finished Steel, 2.084c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe, and black sheets

These products constitute 88 per cent of the

United States output of finished steel

April 4, 1922, 2.048c.
March 14, 1922, 2.019c.
April 12, 1921, 2.693c.
10-year pre-war average, 1.689c.

Composite Price, April 11, 1922, Pig Iron, \$19.14 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

April 4, 1922, \$18.47
March 14, 1922, 18.38
April 12, 1921, 23.71
10-year pre-war average, 15.72

facturers have fuel supplies sufficient to take care of the bulk of their orders, but if any considerable number of consumers find it necessary to have big supplies in a hurry, it would be but a step to the re-establishment of premiums for delivery.

The strike situation in the Connellsville district has grown worse instead of better since a week ago, and to-day only a small percentage of the total number of mines in that district is in operation. This means not only the cutting off of much coal tonnage that was counted on to partly make good the deficiency in the output of union mines, but, what is more important, affects a good many blast furnaces in the Eastern half of the country. About 75 per cent of the blast furnaces in this and nearby districts are dependent upon non-union coal and it is estimated that 25 per cent of the blast furnaces of the country are served by Connellsville coke or coke largely made from coal mined in that district. To-day only such coal as was loaded on cars or is coming out of the few mines still in operation, is available, while coke production and supplies have almost reached the vanishing point. The efforts of the union organizers have been crowned with considerable success aided by the fact that this being Holy Week a great many workmen usually stay away from the mines and coke ovens on religious grounds. It has been the experience of Connellsville operators

for a number of years that the men rarely come out for work during the week preceding Easter.

The pig iron market has been quick to respond to the fuel market developments, with prices up from 50c. to \$1 a ton from where they were a week ago, and makers rather indifferent about taking on tonnages even at the advanced prices.

The past week has also seen further advances in steel prices. Skelp and plates have advanced to 1.50c., Pittsburgh, as a minimum, while light rails have gone to the same price and the adoption of the recent higher sheet prices by independent makers on the part of the American Sheet & Tin Plate Co. has served to establish the advance. Most of the independent wire manufacturers have made an advance of \$2 per ton on nails, and other wire products, with the exception of plain and galvanized wire, but so far the American Steel & Wire Co. has not followed.

Pig Iron.—The market has responded with considerable alacrity to the restriction, both actual and prospective, in production due to the seriousness of the effect of the union coal miners' strike upon the operations of non-union mines. Basic iron now is not available at less than \$19 from Valley furnaces, and while no sales yet have been made at that figure, it is probable that the next transaction will be at \$19 and possibly higher. We note one sale of 2000 tons of this grade to a Pitts-

burgh district melter at the equivalent of \$19.50, Valley furnace, the iron to be shipped from one of the lake stacks. Late last week, there was a sale of 2000 tons of Valley basic at \$18.25 and another of 1000 tons at \$18.50. The N. & G. Taylor Co., Cumberland, Md., is in the market for 3600 tons of basic for delivery in equal quantities over the next three months. Brokers having this inquiry have been scouring the market and bidding \$18.50, furnace, without securing a ton of iron. The Bessemer market now is quotable at \$20, Valley furnace, and sales are expected to be made within the next few days at that figure. All makers of foundry iron now are quoting \$20, furnace, and that price has been done on some fairly large tonnages. Makers in general are indifferent about taking on additional tonnages because even the prices recently established are below costs, and the effort now is in getting prices back at least to costs.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.96 per gross ton:

Basic	\$19.00
Bessemer	20.00
Gray forge	\$19.75 to 20.00
No. 2 Foundry	20.00
No. 3 Foundry	19.75 to 20.00
Forgeable	19.50 to 20.00

Ferroalloys.—Considerable uncertainty has been created as to the ability of the interest which lately has taken orders of close to 20,000 tons of spiegeleisen to make deliveries by reason of the fact that it was running on Connellsville coke and the suspension of many mines and ovens in that district has shut off its supply. It is possible this furnace will be obliged to suspend, as coke is not available from other sources except at very high prices, which would render the spiegeleisen unprofitable at the prices at which it was booked. All makers of ferromanganese now are quoting \$65 Eastern seaboard. New Orleans no longer is classified as an Eastern seaboard port and this means that Chicago district consumers will have to pay \$9.90 per ton freight, this being the rate from Baltimore to Chicago. The all-rail rate from New Orleans to Chicago is \$8.40.

We quote 78 to 82 per cent ferromanganese, \$65 c.i.f. Atlantic seaboard for domestic and English. Average 20 per cent spiegeleisen, \$26.50 to \$30 furnace; 16 to 19 per cent, \$26.50 to \$29 furnace; 50 per cent ferrosilicon, domestic, \$55 to \$60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, \$36.50; 11 per cent, \$39.80; 12 per cent, \$43.10; 13 per cent, \$47.10; 14 per cent, \$52.10; silvery iron, 6 per cent, \$25; 7 per cent, \$26; 8 per cent, \$27.50; 9 per cent, \$29.50; 10 per cent, \$31.50; 11 per cent, \$34; 12 per cent, \$36.50. The present freight rate from Jackson to New Straitsville, Ohio, into the Pittsburgh district is \$4.06 per gross ton.

Iron and Steel Pipe.—Recent withdrawal by makers of steel pipe of discounts beyond the regular figures, coupled with the possibility of a curtailment in production as a result of the coal strike has stimulated purchases and mill order books now are better filled than they have been before in more than a year. One large independent maker is taking only such business as will fit in with existing schedules and this accommodation is being extended only to regular customers. Discounts to-day are nearer the Dec. 16, 1921, card than they have been at any time since that card was issued. The market for wrought iron pipe, while not active, gradually is improving. Discounts are given on page 1035.

Wire Rods.—Makers have practically withdrawn from the market because of the menace to steel production in the fuel situation. Makers are merely supplying orders already on their books and are turning down new business. Prices are given on page 1035.

Wire Products.—Effective April 7, the Pittsburgh Steel Co. announced an advance of \$2 per ton in all wire products except bright and annealed wire, plain galvanized wire and woven wire fence. The new prices which have been adopted by all other manufacturers, except the American Steel & Wire Co., are \$2.40 to \$2.50 base per keg Pittsburgh, for nails, \$3.05 to \$3.15 base for galvanized barbed wire and fence staples, \$2.55 to \$2.65 base for painted barbed wire and polished fence staples and \$1.90 to \$2 per count keg for cement coated nails. Most manufacturers allowed their customers to enter orders for 60 to 90 days, on the old bases. On account of the uncertain coal supply manufacturers are not eager to add to their obligations even at the new prices, and one

large independent virtually has withdrawn from the market.

We quote wire nails at \$2.40 to \$2.50 base per keg, Pittsburgh, and bright basic and Bessemer wire at \$2.25 base per 100 lb., Pittsburgh.

Billets, Sheet Bars and Slabs.—The market is extremely firm at the recent advance, and the possibility that production will be affected by the fuel situation suggests further advances since makers are merely endeavoring to meet their obligations and are either refusing new business or quoting a price which will discourage the purchase. A Valley maker of sheet bars is reported to be seeking tonnages from other makers. Against a recent inquiry for a round lot of 1 1/4-in. billets, a price of \$33 Pittsburgh, was named by one producer. Quotations are unchanged but indications point to premiums for early delivery unless there is an early change for the better in the non-union coal field situation.

We quote 4 x 4-in. scft Bessemer and open-hearth billets at \$29.50 to \$30; 2 x 2-in. billets, \$31; Bessemer and open-hearth sheet bars, \$31; slabs, \$30 to \$30.50; forging billets, ordinary carbons, \$34.50 to \$37.00, all f.o.b. Youngstown or Pittsburgh mills.

Sheets.—The American Sheet & Tin Plate Co. has gone along with the advances named by independent companies and which generally became effective April 1. There was no formal announcement of the change by this company, which merely withdrew the old prices late on April 4, and gave its customers the privilege of entering orders at the old prices up to last Saturday. March bookings of sheet orders by the American Sheet & Tin Plate Co. and the independents combined are reported to have been considerably in excess of 400,000 tons and several of the independent producers are said to be sold up for the entire quarter and to have withdrawn from the market. A shortage of sheet bars is beginning to show and in the event that steel production is affected by the coal miners' strike as now seems likely, delivery against existing sheet orders is likely to suffer. All mills now quote the new prices.

The following discounts on seamless steel merchant boiler tubes, cold-drawn or hot rolled, are announced on carloads, with 4 points fewer off on less than carloads. Carloads: 1 in., 63; 1, 1 1/4 and 1 1/2 in., 55; 1 1/4 in., 36; 2 and 2 1/4 in., 42; 2 1/2 and 2 1/2 in., 46; 3 in., 50; 3 1/4 to 4 in., 55; 4 1/4 to 5 in., 47.

All f.o.b. Pittsburgh, net 30 days, 2 per cent off in 10 days. There is an extra of \$8 per ton for more than four gages.

There is an extra of \$8 per ton for more than four gages heavier than standard; no extras for length up to and including 24 ft.; sizes smaller than 1 in. and lighter than standard gage are sold at the mechanical tube list and discount. Intermediate sizes and gages not listed take the price of the next larger outside dimension and heavier gage discount.

Tin Plate.—The market is extremely firm with all makers committed against production for the next 30 to 45 days, and because of the threat to steel production contained in the suspension of so many non-union coal mines, several makers are not inclined to add to their obligations pending a change in the situation. Mill operations still are high, averaging more than 80 per cent for the entire industry.

Iron and Steel Bars.—The market is firmly pegged at 1.50c. minimum for steel bars and on small lots which are undesirable from a rolling mill standpoint, as much as 1.60c. has been obtained. The leading independent maker in this district is virtually withdrawn from the market because its coal pile is only sufficient for present obligations and it is taking on only such orders as can be fitted into its present schedules, and these orders only from regular customers. There is no change in iron bars.

We quote steel bars rolled from billets at 1.50c.; reinforcing bars, rolled from billets, 1.50c. base; reinforcing bars, rolled from old rails, 1.40c.; refined iron bars, 2c. to 2.10c. in carloads, f.o.b. mill, Pittsburgh.

Steel Skelp.—Although no large sales are being made, the market is stiffening in sympathy with other lines of steel, and is no longer quotable at less than 1.50c. Pittsburgh or Youngstown.

Boiler Tubes.—The market is doing better both as regards prices and demand. This is notably true of seamless steel tubes, prices of which finally have become pretty well stabilized, making it possible to again publish quotations. Until recently there were no regular quotations, prices varying in keeping with the size of the orders and how badly makers wanted business. Lapweld steel tubes also are firmer as a result of a better demand and in keeping with the firmer tendency of steel prices in general. Prices of iron tubes still are restricting orders.

Plates.—The market no longer is quotable at less than 1.50c., Pittsburgh. A local consumer, after carefully canvassing the market, was unable to get a better price on more than 1000 tons. The situation is strengthened not only by the fact that the leading interest is well filled up on orders from car builders, but also because there are a number of independent makers who cannot operate their plate mills profitably at present prices and are out of the market. There is the additional factor in the threatened curtailment of steel production by the walk-out of coal miners in the non-union districts. The Standard Tank Car Co., Sharon, Pa., has put out an inquiry for 10,000 tons of tank plates in connection with its bid on some cars for the New York Central Railroad.

We quote sheared plates, $\frac{1}{4}$ in. and heavier, tank quality, at 1.50c., f.o.b. Pittsburgh.

Structural Material.—The McClintic-Marshall Co. has been awarded the New York Central bridge at Castleton, N. Y. This project involves more than 23,000 tons, which is to be fabricated here, with the steel to be furnished by Carnegie Steel Co. It is several years since any of the local fabricators have had an award of this size. General structural business is expanding, and while the price situation still is spotty, bids against new projects are beginning to reflect the higher market in plain material. The American Bridge Co. will furnish 800 tons for the new building for the University Club, Pittsburgh, while the Memphis Steel Construction Co. has taken 100 tons for a warehouse in Greensburg, Pa. A few protections still are out at low prices, but on any new business now developing, makers are not shading 1.50c., Pittsburgh, for plain material. Prices are given on page 1035.

Steel Rails.—Demand for light rails has been brought practically to a standstill by the coal mine suspension but the market shares the strength of other finished products induced by the threatened curtailment of steel production. The Carnegie Steel Co. now is quoting light rails rolled from new billets at 1.50c. base, thus meeting the prices recently established by leading independents. A feature of the standard rail market is an increasing disposition among the railroads to exercise an option in the original contract allowing them to increase their commitments. It is no secret that the railroads looked upon the price of \$40 mill for standard rails as too high when they entered their contracts, and specifications usually were for six months instead of a year, because of that view.

We quote 25 to 45-lb. sections, rolled from new steel, 1.45c. to 1.50c. base; rolled from old rails, 1.35c. to 1.40c. base; standard rails, \$40 per gross ton mill for Bessemer and open-hearth sections.

Hot-Rolled and Cold-Rolled Strips.—The market has been definitely established at 2c. base, Pittsburgh, for hot-rolled and 3.65c. base Pittsburgh for cold-rolled strips. Makers generally have comfortable backlog in both kinds of material, having booked contracts at recent prices, covering the normal requirements of their customers for the current quarter. There is now a disposition on the part of the manufacturers to decline additional tonnages because of the uncertainty as to steel supplies and plant operations due to the suspension of so many non-union coal mines.

Coke and Coal.—Production of coke in the Connellsville district has fallen away to insignificant proportions as a result of the suspension of so many mines, in that district, and there is practically no quotable market on either furnace or foundry grade. Such recent sales of furnace coke as have been made have been at \$4 to \$4.25 per net ton oven, but furnace interests would not pay these prices, assuming the tonnage to be available, for any considerable quantity because the advance in pig iron has not been sufficient to absorb this increased fuel cost. Foundry coke is quotable at \$4.75 to \$5 per net ton, ovens, on the few small sales recently made. Coal prices are largely determined by how badly the buyer requires supplies. Coal of the grade which recently sold at about \$1.50 per net ton at mines, lately has commanded \$2.25 and we note sales of $\frac{3}{4}$ -in. gas coal as high as \$3.75 at mines.

Steel Chain.—Effective April 1, leading makers

have revised prices downward on trace, butt stake, stage and breast chains. Electrically welded trace and stake chains go to 20 per cent discount on the April 1 list, and butt and stage chains to 50, 10 and 5 per cent off list, against the old discount of 50 per cent. Discount on breast chains is increased 10 per cent.

Cold-Finished Steel Bars and Shafting.—One or two makers have announced a price of 1.90c. base as a minimum on carload lots, but this price is not yet a general minimum and most of the transactions involving sizable tonnages are being done at 1.80c. base. Business is better than it was earlier in the year, but evidently it falls short of capacity and to secure orders the mills find it hard to advance the price in keeping with the recent advance in hot-rolled bars. Ground shafting is unchanged at 2.25c., base mill, for carload lots.

Hoops and Bands.—The market is not especially active, but all makers are quoting 1.90c. base as a minimum and adhering firmly to that figure. On hoops, some producers are endeavoring to establish 2c. base as a minimum.

Nuts and Bolts.—Although business is better, it still leaves much to be desired and the effort of makers is to get quoted prices rather than to attempt to set up an advance. Discounts are given on page 1035.

Rivets.—Continued betterment is reported in business and there also has been some stiffening in prices in that \$2.10 and \$2.20 base per 100 lb. for heavy rivets now are fairly easily obtained, and there has been a virtual disappearance of quotations of less. On small rivets the going discount is 75 and 10 per cent off list, but occasionally an extra 5 per cent is given on especially attractive orders. Prices and discounts are on page 1035.

Spikes and Track Bolts.—Recent advance in spikes by the Republic Iron & Steel Co. has been partially followed by the Jones & Laughlin Steel Co. and Dilworth, Porter & Co., both of whom recently advanced standard spikes \$3 per ton to \$2.15 base per 100-lb. These companies are quoting small spikes at \$2.50 base per 100-lb., the price recently announced by Republic Iron & Steel Co. The Erie Railroad recently closed for 1500 kegs of standard spikes, this business going at the old base of \$2 per 100 lb. Track bolts are rather inactive here, but an early betterment in business is expected. Prices are given on page 1035.

Old Material.—The market has lost none of its strength, although the mills are balking at paying the prices now being asked by dealers, or in meeting the competition of dealers on current offerings. On heavy melting steel, \$16.50 is maximum as far as mill purchases are concerned, but dealers have paid \$17 or more on railroad offerings, evidently on the theory that even higher prices will prevail before they are obliged to provide shipping instructions. With \$16.50 obtainable at Johnstown for heavy melting steel from the East and Youngstown mills paying \$17 and higher on Western material, any demand that springs up here would be hard to meet under \$17.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh.....	\$16.00 to \$16.50
No. 1 cast, cupola size.....	16.50 to 17.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.....	16.00 to 16.50
Compressed sheet steel.....	14.50 to 15.00
Bundled sheets, sides and ends.....	13.00 to 13.50
Railroad knuckles and couplers.....	17.00 to 17.50
Railroad coil and leaf springs.....	17.00 to 17.50
Low phosphorus standard bloom and billet ends.....	18.00 to 18.50
Low phosphorus plates and other grades.....	17.50 to 18.00
Railroad malleable.....	14.00 to 14.50
Iron car axles.....	24.00 to 25.00
Locomotive axles, steel.....	22.00 to 23.00
Steel car axles.....	17.00 to 17.50
Cast iron wheels.....	16.00 to 16.50
Rolled steel wheels.....	17.00 to 17.50
Machine shop turnings.....	11.25 to 11.75
Sheet bar crop ends.....	16.00 to 16.50
Heavy steel axle turnings.....	12.50 to 14.00
Short shoveling turnings.....	13.00 to 13.50
Heavy breakable cast.....	16.00 to 16.50
Stove plate.....	13.00 to 13.50
Cast iron borings.....	12.00 to 13.50
No. 1 railroad wrought.....	12.50 to 13.00

Chicago

CHICAGO, April 11.

The coal strike is causing more concern than was the case at first, as it now develops that the unions have succeeded in closing some non-union mines. Just to what extent the production of the non-union field will be affected is not yet apparent, but at any rate operations of steel works and furnaces in the district are protected for at least 60 days by coal supplies in stock. There is no doubt that iron and steel buyers are commencing to take cognizance of the strike and if productive capacity is curtailed in any section of the country, the tendency of prices will be to advance. Already local offices of Eastern mills are receiving inquiries for materials on which local producers are unable to make prompt delivery. While the first effect of the strike will be to stimulate market activity, a protracted shutdown of the mines will force consumers as well as producers to suspend operations, thereby stopping buying. It is regarded unlikely that the condition will come to pass, but it is to be noted that in a few directions demand has already been affected adversely. The coal carrying railroads, for example, are decreasing expenditures for supplies because their main source of revenue has been shut off.

While the strike has added an element of uncertainty to the market, the rate of buying up to date has been steadily better. For one important local steel interest the first week in April was the best in tonnage booked since 1920, while bookings for March were twice those of January.

Mill operations have shown another gain. The Illinois Steel Co. has blown in its seventeenth furnace and is producing steel at the rate of 80% per cent of ingot capacity. Its Gary works is on an 88½ per cent basis with all mills except the rail mill running full.

Prices are generally firm and advances are looked for. In fact, the Inland Steel Co. to-day announced an advance to 1.80c., Chicago, on plates, and to 1.70c. on structural shapes and bars.

Ferroalloys.—There is a movement on foot among English producers of ferromanganese to discontinue using New Orleans as a quotable shipping point and to base all quotations on shipment from Baltimore. This would mean an addition of \$9.90 freight to the seaboard price instead of \$8.40, as is now the case.

We quote 78 to 82 per cent ferromanganese, \$73.40, delivered; 50 per cent ferrosilicon, \$56 to \$57.50, delivered; spiegeleisen, 16 to 18 per cent, \$40.10, delivered.

Pig Iron.—The market is increasingly active with numerous contracts being placed for second and third quarter and some for the entire last half. The tonnage of Northern iron booked thus far in April exceeds that placed during the entire first quarter. While the current rate of buying exceeds that of March by a considerable margin, it is notable that the volume of business placed in that month was larger than that for any month for a year and a half. A second Iroquois furnace went in last week, as forecast in this column, and a third is expected to be blown in soon. Prices are very firm and a steel works furnace producing merchant malleable is expected to announce an advance to \$21 within the next few days. Any suspension in output in the East due to the strike would no doubt result in higher prices which will be reflected in increased strength in other markets. Chicago district production, however, is not likely to be affected for 60 days, as fuel stocks are ample to cover that period. Current buying is general, although less basic is being bought for forward delivery than malleable and foundry. Railroad equipment manufacturers are prominent buyers, one being about to place 10,000 to 15,000 tons. Building activity is also reflected in liberal purchases by manufacturers of heating and sanitary equipment and various household appurtenances. A manufacturer of this class is in the market for 10,000 tons of foundry. The present rate of building construction is probably greater than is generally appreciated. Structures started in the United States in March are said to represent an investment exceeding by 40 per cent the best previous monthly record.

Southern iron continues to be bought rather liberally. Foundry for delivery by barge and rail is quoted at \$21.17, Chicago, instead of \$21.06 as reported last week. One furnace using the all rail route is still quoting \$15, Birmingham for prompt shipment and \$15.50 for third quarter.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging

sil. 1.50, delivered at Chicago	\$26.00
Northern coke, No. 1, sil. 2.25 to 2.75	20.50
Northern coke, foundry, No. 2, sil.	
1.75 to 2.25.....	20.00
Northern high phos.....	20.00
Southern foundry, sil. 1.75 to 2.25.....	\$21.17 to 22.67
Malleable, not over 2.25 sil.....	20.00
Basic.....	20.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free.....	30.00
Silvery, sil. 8 per cent.....	32.82

Railroad Equipment.—The Louisville & Nashville has placed 1050 steel hopper cars with Cambria Steel Co. and 500 composite gondola cars with the Chickasaw Shipbuilding & Car Co. The Chicago & Northwestern will open bids a second time on 2600 freight cars April 22. The American Refrigerator Transit Co. has let repairs on 200 refrigerator cars to the American Car & Foundry Co. and on 100 to the Missouri Pacific Railroad. The Elgin, Joliet & Eastern has let 200 underframes and 300 side dump car bodies to James G. Heggie & Sons. The New York Central is expected to enter the market for repairs on 30,000 freight cars. The St. Paul has ordered 25 mikado type locomotives from the American Locomotive Co. The Denver & Rio Grande is about to place 10 mountain type engines and the Norfolk Southern is inquiring for five freight engines.

Steel Castings.—The new discounts recently announced by the American Steel Foundries are being adopted rather generally. The steel castings makers are rather slow in feeling the effects of recent car building. The miscellaneous castings for over 37,000 cars placed within the past 30 days are still to be bought. The Philadelphia & Reading placed the sideframes for 1500 cars amounting to 2250 tons, with the American Steel Foundries.

Cast Iron Pipe.—Prices are stiffening, the base price now ranging between \$34 and \$35, Birmingham. Recent awards include:

Lima, Ohio, 2000 tons to James B. Clow & Sons.
Ziegler, Ill., 200 tons to National Castiron Pipe Co.
Genesee, Ill., 250 tons, to United States Cast Iron Pipe & Foundry Co.
Blue Island, Ill., 100 tons to American Cast Iron Pipe Co.
Evansville, Ill., 300 tons to American Cast Iron Pipe Co.

Inquiries include:

Detroit, 500 tons, bids in April 17.
Stevens Point, Wis., 700 tons April 18.
Wauwatosa, Wis., 2880 feet of 6 and 8-in., April 21.
We quote per net ton f.o.b. Chicago, as follows: Water pipe, 4-in., \$47.10 to \$48.10; 6-in. and above, \$43.10 to \$44.10; class A and gas pipe, \$3 extra.

Rails and Track Supplies.—At least two Eastern independents have advanced standard railroad spikes to 2.25c., Pittsburgh, and while local makers have not yet adopted this price, they are expected to do so. An advance in bolts is also looked for and tie plates are now firm at a minimum of \$35, mill, with some producers quoting more. Business in track supplies is heavy. Within the past week, one local maker booked an aggregate of 12,000 tons of tie plates besides numerous orders for spikes and bolts averaging 2000 to 3000 kegs each, with one order for spikes totaling 6500 kegs.

Standard Bessemer and open hearth rails, \$40; light rails rolled from new steel, 1.50c., f.o.b. makers' mills.

Standard railroad spikes, 2c. to 2.25c., Pittsburgh; track bolts with square nuts, 3c. to 3.05c., Pittsburgh; tie plates, steel and iron, 1.75c., f.o.b. mill; angle bars, 240c., f.o.b. mill.

Plates.—Business continues to improve with prices steadily growing firmer and mill deliveries less prompt.

The mill quotation is 1.60c., Chicago. Jobbers quote 2.38c. for plates out of stock.

Bolts and Nuts.—Jobbers, automobile makers, and railroads are buying liberally, in some cases placing contracts for the entire second quarter, and even the farm implement manufacturers are placing some business. In the opinion of some sellers, the coal strike has stimulated buying, but it is not likely that this factor alone accounts for the improvement in demand which became noticeable about the middle of March. Discounts are increasingly firm and an advance is looked for by some observers.

Jobbers quote structural rivets, 3c.; boiler rivets, 3.10c.; machine bolts up to $\frac{3}{8}$ x 4 in., 60, 10 and 10 per cent off; larger sizes, 60 and 10 off; carriage bolts up to $\frac{3}{8}$ x 6 in., 60 and 10 off; larger sizes, 55 and 5 off; hot pressed nuts, square and hexagon tapped, \$3.75 off; blank nuts, \$4 off; machine or lag screws, gimlet points, square heads, 65 and 5 per cent off. Quantity extras are unchanged.

Sheets.—The leading maker has now followed the independents and prices are entirely at the advanced level. While sales are being made at the higher prices, consumers covered heavily at the old prices with the result that mills are heavily booked, in some cases into third quarter.

Mill quotations are 3.15c. for No. 28 black, 2.40c. for No. 10 blue annealed and 4.15c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 3.38c.; No. 28 black, 4.15c.; No. 28 galvanized, 4.15c.

Structural Material.—The building industry remains active with fabricators laying in stocks and architects taking bids on structures for which plans have not been completed, each for the sake of gaining protection against expected advances in mill prices. The Stratford Building, Chicago, and the Ft. Wayne, Ind., truck plant of the International Harvester Co. are projects of the sort described which are now before the trade. It is estimated that the former will require 8000 tons and the latter at least 3500 tons. The Belknap Hardware Co. warehouse at Louisville has been revived, alternative bids on structural steel and reinforced concrete designs to be received April 12. Fabricating awards include:

Masonic Temple, Salina, Kan., 1240 tons, to Fort Pitt Bridge Works.

Loop Motor Hotel, Chicago, 2500 tons, to American Bridge Co.

Union Pacific System, reconstruction of bridge, Parker, Wash., 760 tons, to American Bridge Co.

Draw span, San Joaquin River, Stockton, Cal., 500 tons, to McClintic-Marshall Co.

Penitentiary chair factory, Fort Madison, Iowa, 225 tons, to Christopher & Simpson Iron Works.

First National Bank, Tulsa, Okla., 300 tons, to Kansas City Structural Steel Co.

Babcock highway bridges, St. Louis County, Minn., 201 tons, to American Bridge Co.

Chicago, Milwaukee & St. Paul, track elevation work, Chicago, 148 tons, to American Bridge Co.

Grand Opera House roof, St. Louis, 118 tons, to Decatur Bridge Co.

Gordon Bakery, Chicago, 100 tons, to Union Foundry Co. Main Street bridge, Rock River, Mayville, Wis., 100 tons, to Worden-Allen Co.

Pending business includes:

Central Illinois Telephone Co., power station, Muddy, Ill., 331 tons.

Commonwealth Edison Co., Chicago, addition to Calumet power station, 2500 tons.

The mill quotation on plain material is 1.60c. Chicago. Jobbers quote 2.38c. for plain material out of warehouse.

Reinforcing Bars.—The Belknap Hardware Co. warehouse, Louisville, will come up for bids again on April 12, and will require from 1500 to 2000 tons, if a reinforced design is decided upon in preference to structural steel. The Ft. Wayne, Ind., truck plant of the International Harvester Co. will require a considerable quantity of reinforcing bars, the tonnage not yet having been estimated. The activity in the reinforcing field cannot be accurately gaged without taking into account innumerable small projects taking less than 100 tons which, while individually insignificant, make an imposing total in the aggregate. Considerable highway work is also being placed in Wisconsin, Illinois and Iowa in lots of 50 to 100 tons. According to the estimate of a leading reinforcing company, more tonnage has been placed in this district within the past

three weeks than was contracted for during the entire preceding six months. Warehouse prices on deformed bars are now firm at 2c., base. Recent awards include:

Chicago, Burlington & Quincy freight house, Chicago, 800 tons, to Corrugated Bar Co.

Chemistry Building, University of Iowa, 300 tons, to Corrugated Bar Co.

Children's Hospital and Nurses' Home, Milwaukee, 300 tons, to Robertson & Jackson, Milwaukee.

Bridge, Iron Mountain, Mich., 300 tons, to Paul J. Ka'man Co. instead of Concrete Engineering Co., as announced last week.

Wiener Building, Milwaukee, 100 tons, to Corrugated Bar Co.

Pending work includes:

Bridge, Hazleton, Ind., 150 tons.

International Harvester Co., warehouse, Louisville, Ky., 300 tons.

Streeterville Hotel, Chicago, 300 tons.

Commonwealth Edison Co., Chicago, addition Calumet power station, 250 tons.

Western Electric Co., Hawthorne, Ill., addition, 150 tons.

Wire Products.—Most independents have announced advances of 10c. per 100 lb. on wire nails, cement coated nails, galvanized wire, barbed wire and staples, and the leading interest is expected to follow. The prices of plain wire and fence remain unaffected. Demand continues to expand steadily. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1035.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, \$2.85 per 100 lb.; No. 9 and heavier bright basic wire, \$3 per 100 lb.; common wire nails, \$3 per 100 lb.; cement coated nails, \$2.50 per keg.

Old Material.—Consumers are again entering the market rather generally and are buying at advancing prices. Purchases of open-hearth grades have been particularly liberal, but gray iron and malleable foundries are also buying more freely, and even the iron mills which have held more or less aloof from the market are placing some orders. Demand is steadily assuming a general character, reflecting widespread business betterment. Barring an unexpected turn in the coal strike which would cut off the mills supplies for non-union mines and an earlier reduction in scrap freight rates than is generally looked for, sellers see nothing to interrupt the upward swing in prices now under way. Railroad offerings include: Union Pacific, 3000 tons; Great Northern, 2500 tons; Soo Line, 500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	\$17.00 to \$17.50
Relaying rails	20.00 to 25.00
Cast iron car wheels	18.25 to 18.75
Rolled or forged steel car wheels	15.25 to 15.75
Steel rails, rerolling	14.00 to 14.50
Steel rail's less than 3 ft.	14.00 to 14.50
Heavy melting steel	13.25 to 13.75
Frogs, switches and guards cut apart	13.25 to 13.75
Shoveling steel	13.00 to 13.50
Low phosph., heavy melting steel	15.25 to 15.75
Drop forge flashings	9.00 to 9.50
Hydraulic compressed sheet	9.50 to 10.00
Axle turnings	9.75 to 10.25
	Per Net Ton
Iron angles and splice bars	15.50 to 16.00
Steel angle bars	12.25 to 12.50
Iron arch bars and transoms	16.50 to 17.00
Iron car axles	20.50 to 21.00
Steel car axles	14.75 to 15.25
No. 1 busheling	9.50 to 10.00
No. 2 busheling	6.25 to 6.75
Cut forged	11.50 to 12.00
Pipes and fittings	8.50 to 9.00
No. 1 railroad wrought	11.75 to 12.00
No. 2 railroad wrought	11.75 to 12.25
Steel knuckles and couplers	13.50 to 14.00
Coil springs	13.75 to 14.25
No. 1 machinery cast	14.75 to 15.25
No. 1 railroad cast	14.25 to 14.75
Low phosph. punchings	12.00 to 12.50
Locomotive tires, smooth	11.25 to 11.75
Machine shop turnings	5.75 to 6.25
Cast borings	7.75 to 8.25
Stove plate	13.50 to 14.00
Grate bars	11.50 to 12.00
Brake shoes	12.00 to 12.50
Railroad malleable	13.75 to 14.25
Agricultural malleable	13.75 to 14.25

The plant of the Babcock Printing Press Manufacturing Co., New London, Conn., recently went on full time capacity for several hundred employees, and the prospects are that it will be continued for some months. The company makes flat bed printing presses.

New York

NEW YORK, April 11.

Pig Iron.—The past week has been characterized by a feverish condition of the market with very active demand, a large amount of buying, rapid advances in prices and a general withdrawal of furnaces from the market. These conditions were due in part to a genuine increase in demand for castings, but the strike of coal miners causing a shortage of coal and coke, with much uncertainty as to whether many blast furnaces will be able to continue in operation, was an important factor of the situation. The largest buying of the week was about 18,000 tons in New England placed through Boston agencies and the contracting by Davies & Thomas for iron for making the cast iron segments for the vehicular tunnel. The contractors placed 30,000 tons with the Empire Steel & Iron Co., and 15,000 with the Bethlehem Steel Co., deliveries to be made over the next two years, but a large percentage of the iron will be furnished by the Bethlehem company which will also furnish the pig iron for the 62,000 tons of segments which it will cast for the tunnel. Prices in eastern Pennsylvania have advanced to a basis of \$21 for No. 2 plain, while the only iron available at Buffalo is on the basis of \$20 furnace for No. 2 plain. Nearly all of the producers are out of the market and are selling only to old customers in very limited tonnages. Many melters, especially small foundries, after a long period of indifference, have been trying earnestly to place orders in the last few days, and have not hesitated to pay the advanced prices.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$5.46 from Buffalo and \$6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25.....	\$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	24.02
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	23.52
Buffalo, sil. 1.75 to 2.25.....	25.46
No. 2 Virginia, sil. 1.75 to 2.25.....	28.16

Fermanganese.—The fermanganese market is fairly active so far as carload and small lots are concerned and sales of 2000 to 3000 tons of both British and American alloy have been made in the last week or so, the later transactions having been done at \$65, seaboard. Another advance in the price for domestic fermanganese was announced to-day of \$5 per ton, or to a basis of \$70, seaboard, and it is probable that the British will also meet this price, as was the case last week. Advancing costs, due partly to the coal situation, are given as among the reasons for the advance. Inquiries continue good. The one for 3000 tons, noted last week, has been withdrawn. The market for spiegleisen is fairly active and sales for both grades have been made amounting to 500 or 1000 tons, made up of various orders. While previous to this time the 20 per cent grade, in large quantities, could have been bought under \$30, furnace, this price is now regarded as a minimum with the possibility that it may advance, depending on developments in the fuel situation. There have been no developments in the manganese ore market, which continues inactive. Moderate sales of 50 per cent ferrosilicon have been made at prevailing prices. Quotations are as follows:

Ferroalloys

Fermanganese, domestic, seaboard, per ton..	\$65.00
Fermanganese, British, seaboard, per ton..	\$65.00
Spiegleisen, 16 to 19 per cent, furnace, per ton..	\$29.00
Spiegleisen, 20 per cent.....	\$30.00
Ferrosilicon, 50 per cent, delivered, per ton	
	\$55.00 to \$60.00
Ferrotungsten, per lb. of contained metal.	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to	
70 per cent Cr., per lb. Cr., delivered.....	13c.
Ferrovanadium, per lb. of contained vanadium	\$4.00

Ores

Manganese ore, foreign, per unit, seaboard.	25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates.....	\$2.00 up
Chrome ore, 40 to 45 per cent Cr ₂ O ₃ , crude, per net ton, Atlantic seaboard.....	\$20.00 to \$25.00
Chrome ore, 45 to 50 per cent Cr ₂ O ₃ , crude, per net ton, Atlantic seaboard.....	\$25.00 to \$27.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	45c.

Cast-Iron Pipe.—The market continues extremely active and prices, despite the recent advance, are as firm as ever. The tender of the Department of Water Supply, Gas and Electricity, New York, which was

opened April 5, calling for 1000 tons of pipe and fittings, was awarded to the Carter Contracting Co., Brooklyn. Bids were opened April 10 by the Department of Water Supply, Newark, N. J., on 200 tons of 30-in. pipe. The Warren Foundry & Machine Co. was the low bidder. On April 19, bids will be opened by the City of Harrisburg, Pa., Department of Water Supply, on about 135 tons of 6-in., 8-in., 10-in. and 12-in. pipe. Bids are being received until April 20 by the Buffalo Bureau of Water Supply on 1000 tons of 4-in. to 16-in. pipe. We quote per net ton, f.o.b. New York, carload lots, as follows: 6-in. and larger, \$48.80; 4-in. and 5-in., \$53.80; 3-in., \$63.80, with \$4 additional for Class A and gas pipe.

Warehouse Business.—About the most active items in this district at present are plates, bars and galvanized sheets. A fair activity in structural material is also reported. In accordance with recent mill increases in black and galvanized sheets, warehouses here have advanced prices, but the advance is rather uneven. While some satisfactory orders on both black and galvanized are said to have recently gone on a basis slightly less than 4c. for black and 5c. for galvanized, the leading independent interest has brought its quotation up to 4.25c. per lb. on black and 5.25c. per lb. on galvanized. Other warehouses are quoting on a basis of 4c. and 5c. and a few are maintaining a price of 4.15c. and 5.15c. per lb. With the coal strike accelerating the upward trend of mill prices, most warehouses expect an early change of warehouse quotations to give a more satisfactory spread. The wrought iron and steel pipe market continues dull, but there is slightly less inclination to shade the established quotations. Brass and copper warehouses report increased activity. We quote prices on page 1056.

High Speed Steel.—A slight improvement is reported generally. Prices, however, are slightly weaker. The special brand of one company has been reduced to 95c. per lb., and a fair estimate of the market on 18 per cent tungsten high speed steel is 75c. to 80c. per lb.

Semi-Finished Steel.—Higher quotations on billets now rule generally. Open hearth rerolling billets are quoted at \$29.50 to \$30, Pittsburgh, while Buffalo mills quote as high as \$31, Buffalo.

Finished Iron and Steel.—If there was any uncertainty as to the firmness of the recently advanced steel prices, this has been removed within the past week, since the seriousness of the coal strike has become apparent. Mills which were counting on the output of non-union mines to furnish them with sufficient coal to operate are now not so sure of their coal supply, if the strike continues for a long period. For example, the Jones & Laughlin Steel Co., Pittsburgh, purchased the output of four non-union mines, but when the non-union miners employed at these mines went on strike the company immediately withdrew from the market and is now offering for sale only such steel as it has in stock. Other steel companies are picking and choosing their business in a manner that is suggestive of the active months of 1919 and 1920. Some companies have notified their district sales agents to submit every inquiry before making commitments. A fairly representative quantity of business in plates, shapes and bars has been booked by various mills at 1.50c., Pittsburgh, and although it was conceded a week ago that large buyers of plates, such as car companies, might be able to cover at 1.40c., Pittsburgh, it does not appear this week that it would be so easy for them to do so unless they have already obtained protection at that figure. Some of the car companies which received car orders from the New York Central Railroad have stated to mill representatives quoting 1.50c., Pittsburgh, that they expect to cover at less than 1.40c., Pittsburgh, but if such figures are available to the car companies, it does not follow that they can be obtained by the ordinary buyer of smaller lots. The \$3 advance on sheets, which became effective April 1, is now generally quoted by all sheet manufacturers, but only small orders are being booked at the higher prices, as most jobbers and manufacturing consumers covered for second quarter prior to the advance. The ad-

vance on wire nails, started by the Pittsburgh Steel Co., has been put into effect by practically all producers, the new quotation being \$2.50 per 100 lb. keg, a rise of \$2 a ton. Plain wire remains at 2.25c. per lb., Pittsburgh, but barbed wire has been advanced in the same amount as nails, or to 3.15c. per lb.; galvanized staples are 3.15c.; galvanized poultry netting staples, 4.15c.; galvanized twisted barbless wire, 3.15c. and cement coated nails, \$2 per keg of 68 to 71 lb. The demand for wire nails is exceptionally large, one New York jobber reporting the largest business in March he has ever done. Tin plate is firm at \$4.75 per base box, Pittsburgh, in ordinary lots, though the large buyer possibly can still find mills willing to accept business at \$4.60. The Great Atlantic & Pacific Tea Co. is inquiring for 25 to 30 carloads of tin plate. The Standard Oil Co. of New Jersey has placed an order for 2000 tons of heads for oil stills, which is in addition to a similar tonnage bought a few weeks ago. Bar iron is firm and higher in price, Eastern mills now quoting 1.45c. to 1.50c., Pittsburgh.

Structural Material.—The New York Central Railroad has placed the contract for a bridge across the Hudson River at Castleton, N. Y., with the McClintic-Marshall Co., Pittsburgh, the steel involved amounting to 23,000 tons. The Phoenix Iron Works Co., Meadville, Pa., has received the contract for 20 additional oil storage tanks for the Sinclair Crude Oil Purchasing Co., requiring 6800 tons of steel. The American Bridge Co. has taken a large number of contracts within the week, including a new hotel in Philadelphia, 5600 tons, and the Pershing Square office building, New York, 5400 tons, Post & McCord being the steel erectors on the latter job. Other awards include the following:

Philadelphia & Reading bridge, Philadelphia, 500 tons, to American Bridge Co.

Alterations to Empire Hotel, Sixty-third Street and Broadway, New York, 400 tons, to American Bridge Co.

Building for Passaic Trust Co., Passaic, N. J., 350 tons, to American Bridge Co.

Lawrence Street subway station, Brooklyn, 500 tons, to American Bridge Co.

Fourteenth Street subway extension, Brooklyn, 1200 tons, to American Bridge Co.

High school building at Middletown, N. Y., 350 tons, to American Bridge Co.

Stacks for Brooklyn Edison Co., 350 tons, to Chicago Bridge & Iron Works.

Store building at Scranton, Pa., 1000 tons, to Anthracite Bridge Co.

Two buildings for Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., 300 tons, to American Bridge Co.

Addition to National Bank of Commerce, Norfolk, Va., 450 tons, to American Bridge Co.

Apartment, East Sixty-third Street, New York, 300 tons, to Hedden Iron Construction Co.

Commercial National Bank, High Point, N. C., 650 tons, to a local fabricator.

Two highway bridges in Maine, 300 tons, to Boston Bridge Works.

Inquiries for new steel structures include the following:

Keith's Theater, Brooklyn, 1800 tons.

City of Boston, Chelsea bridge, 3000 tons.

Building for Jefferson Medical College, Philadelphia, 750 tons.

Building for Greenwich Savings Bank, New York, 300 tons.

The White Construction Co., New York, was low bidder on the new baseball stadium for the New York Yankees (American League) park. The amount of steel involved is 2000 tons.

We quote for mill shipments, New York, as follows: Soft steel bars, plates and structural shapes, 1.88c.; bar iron, 1.83c. to 1.88c. On export shipments the freight rate is 28.5c. per 100 lb. and the domestic rate is 38c.

Railroad Equipment.—Close to 400,000 tons of steel will be required for railroad cars and locomotives placed within the past week or now pending. Foremost in the new buying is that of the New York Central Railroad, which has placed formal orders for the freight cars mentioned in this column last week. Its purchases include 6000 all-steel box cars, 3000 70-ton hopper cars, 1500 low-side gondolas, 2000 55-ton hopper cars, 2000 high-side gondolas and 1500 refrigerator

cars, a total of 16,000. These cars are reported distributed as follows: Standard Steel Car Co., 4500; American Car & Foundry Co., 4500; Pressed Steel Car Co., 3000; the Merchants' Despatch Transportation Co., 1500 refrigerator cars; General-American Car Co., 1000; Pullman Co., 1000; Ralston Steel Car Co., 500. Bids have also been received by the New York Central on 50 locomotives, orders for which are expected shortly, and the same road will receive bids up to April 20 on 32,000 tons of 80, 90 and 105-lb. rails. The Louisville & Nashville Railroad has placed orders for 2000 cars, 1000 steel hoppers being placed with the Cambria Steel Co. and 1000 composite gondolas with the Mount Vernon Car Mfg. Co. The Chicago & Northwestern has rejected all of the bids it recently received and is asking for new bids on 2750 freight cars of miscellaneous types. The Southern Pacific is in the market for 2000 50-ton automobile cars. Other inquiries include the following: Florida East Coast, 400 refrigerator cars; Missouri Pacific, repairs to 200 freight cars; Missouri, Kansas & Texas, 2000 automobile cars; American Refrigerator Transit Co., St. Louis, 2000 refrigerator cars; Tennessee Central, 300 composite gondolas, 50 stock cars and 50 box cars. The Merchants' Despatch will build 1500 refrigerator cars in its own shops. The American Locomotive Co. has booked orders for 28 locomotives within the past week, 10 mountain type for the Denver & Rio Grande Western; 8 from the Tennessee Central; 4 Mikado type and eight switching locomotives for the Louisville & Nashville. The Buffalo, Rochester & Pittsburgh has inquired for 28 locomotives.

Coke.—Despite the important developments in the coal strike, the coke market shows little change, although there is little, if any, foundry coke available at \$4.25, and the usual quotation is from \$4.50 to \$5. By-product coke prices are unchanged at \$8.85 for deliveries to points on the Pennsylvania, Erie and Lackawanna railroads and \$9.09 to points on the Central of New Jersey.

Old Material.—The market continues intensely active with a steady upward trend. A fairly wide range is beginning to show in buying prices in this district on No. 1 heavy melting steel, as low as \$9.35 per ton and as high as \$10.50 per ton, being done. All cast scrap continues relatively weak. The No. 1 machinery cast that will be used by the Davies & Thomas Co., Catasauqua, Pa., in casting the iron segments for the Hudson River tunnel, will probably come into the market in about a fortnight. The company has not yet determined the proportion of this scrap that will be used. The German inquiries for No. 1 heavy melting steel, which recently appeared in the market, have aroused but little interest, as a price of about \$16 per ton, c.i.f. Hamburg, is expected. At present prices, a sale on this basis would mean a heavy risk of loss to the seller if extra handling or demurrage charges were encountered.

Buying prices per gross ton, New York, follow:	
Heavy melting steel, yard.....	\$9.50 to \$10.00
Steel rails, short lengths, or equivalent	10.50 to 11.00
Rerolling rails	10.50 to 11.00
Relaying rails, nominal.....	27.00 to 28.00
Steel car axles.....	10.50 to 11.00
Iron car axles.....	18.50 to 19.00
No. 1 railroad wrought.....	11.00 to 11.50
Wrought iron track.....	10.50 to 11.00
Forge fire	5.50 to 6.00
No. 1 yard wrought, long.....	10.50 to 11.00
Cast borings (clean).....	7.00 to 7.50
Machine-shop turnings	6.50 to 7.00
Mixed borings and turnings.....	6.00 to 6.50
Iron and steel pipe (1 in. diam. not under 2 ft. long).....	8.50 to 9.00
Stove plate	9.75 to 10.25
Locomotive grite bars.....	10.50 to 11.00
Malleable cast (railroad).....	9.00 to 9.50
Cast-iron car wheels.....	10.50 to 11.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast.....	\$17.00 to \$17.50
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	16.00 to 16.50
No. 1 heavy cast, not cupola size....	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	11.00 to 11.50

Philadelphia

PHILADELPHIA, April 11.

The seriousness of the coal and coke situation is the outstanding feature of this week's iron and steel markets. Pig iron has been affected more than steel, but the steel companies are proceeding with a degree of caution in booking business. A leading Pittsburgh independent has withdrawn from the market entirely, and several other companies have notified district sales offices to submit every inquiry before quoting. The effect upon the steel consumer is that there is less hesitation about placing orders at the higher prices which are in effect on nearly all products, and in some instances consumers are showing a degree of urgency that has not characterized their dealings until within the past few days. In foundry pig iron, there has been an advance of \$1 a ton by eastern Pennsylvania furnaces and, with one exception, all have withdrawn temporarily from the market. Just prior to the advance in price, which went into effect late last week, a good deal of business was booked and the danger of a coke shortage has brought about a more cautious selling policy.

Ore.—An Eastern steel company has purchased about 15,000 tons of Swedish ore, which will soon be shipped to this country. The price was not divulged, but is said to be substantially lower than the delivered cost of Lake Superior ore.

Pig Iron.—Last week all of the eastern Pennsylvania producers of foundry iron advanced prices 50c. a ton, after notifying their customers to whom quotations had been given to act on them promptly. This notification brought in orders for a far greater tonnage of iron than the furnaces cared to take in view of the precariousness of the coke situation, and resulted in a further advance of 50c. a ton on Monday, a total of \$1, and the withdrawal from the market temporarily of every furnace interest except one in this district. One company will hold a meeting on Thursday to decide what action to take regarding further selling. There is talk of more price advances unless there is speedy recovery of shipments of coke from the Connellsville region. Whether furnaces have coke contracts or have depended on purchases for spot shipment, the situation is the same. Shipments of coke cannot be guaranteed by the producers. A premium of several dollars a ton was paid by one furnace making ferromanganese to prevent banking. A steel company which last week put a furnace in blast states that it could have sold 50,000 tons of foundry last week, had it desired to do so, but it is already booked up to July 1 and does not care for more iron business under present conditions. A heating equipment manufacturer in the New York district bought 6000 tons of foundry and a Westfield, Mass., consumer bought 6000 tons. There were many other sales of smaller quantities. Many consumers who have bought recently are trying to hurry up shipments, and altogether there is more of a scramble for iron than has been in evidence since the first half of 1920. Nor is the demand for pig iron confined to foundry grades. Basic consumers are anxious to buy, one company having made inquiry to-day for 5000 tons for prompt shipment. A Delaware steel company bought 1000 tons and will probably take more, while an eastern Pennsylvania plate manufacturer, reported last week as having bought a tonnage, has placed orders for a total of close to 20,000 tons. Basic iron is higher, sales in the past few days having been made at about \$21, delivered, and it is stated that this price is lower than will be done on pending inquiry. A sale of 2000 tons of gray forge iron was made at \$20, furnace. The National Radiator Co. is in the market for 1500 tons of foundry for its Trenton, N. J., plant and a similar tonnage for its Johnstown, Pa., plant. The prices quoted below on foundry iron are largely nominal with some furnaces, pending their decision as to what they will do on inquiries that may be presented to them this week. Though \$22.34 is

given as the nominal delivered price on No. 2X iron, a sale has been made at 50c. a ton above this figure.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to \$1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sll.	\$21.84 to \$22.64
East. Pa. No. 2X, 2.25 to 2.75 sll.	22.34 to 22.54
Virginia No. 2 plain, 1.75 to 2.25 sll.	26.24 to 26.74
Virginia No. 2X, 2.25 to 2.75 sll.	27.24 to 27.74
Basic delivered eastern Pa.	21.00 to 21.25
Gray forge	21.00
Malicable	24.00 to 25.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	28.00

Ferroalloys.—Domestic makers of ferromanganese have advanced their price to \$70, seaboard, on standard grade but the British makers are still quoting \$65. The action of the domestic makers was taken to protect themselves in view of the coke situation.

Semi-Finished Steel.—An Eastern consumer came into the market last week for 2000 tons of small re-rolling billets and is believed to have bought at \$31, Pittsburgh, though some quotations were higher than this. Several smaller lots of forging billets have been sold at \$34.50 and \$35, Pittsburgh.

Plates.—While a good deal of plate business has been booked by Eastern mills at 1.50c., Pittsburgh, the market is apparently not yet firmly established at that level, and in this respect plates remain the exception. On 1400 tons which Eastern mills declined to take at less than 1.50c., Pittsburgh, a Pittsburgh mill bid 1.40c. and took the business. However, it appears that only exceptional tonnages, both as to size and character of the specification, can be bought below 1.50c. Plate mill operations are increasing, both Lukens Steel Co. and the Midvale Steel & Ordnance Co. having put on two additional open-hearth furnaces this week at their Coatesville plants. The Chesapeake & Ohio Railroad, which has inquired for only a part of the 5250 cars it is planning to buy, will issue inquiries this week for the remainder. Demand for oil country boilers is increasing, one such order calling for 400 boilers with 800 flanged heads.

Structural Material.—A good many of the recent structural jobs in Philadelphia and vicinity which have recently been let have been taken at such low prices that some of the nearby fabricators could not compete, with plain material now costing them 1.50c., Pittsburgh. Several attractive projects are pending, including a high school at Scranton, Pa., requiring 1000 tons; an office building for the Washington Square Realty Co., Philadelphia, 550 tons; the Hotel Sylvania, Philadelphia, about 2000 tons. The American Bridge Co. was awarded the steel for the new Hotel Benjamin Franklin, 5600 tons. Plain material is firm at 1.50c., Pittsburgh.

Bars.—The firmness of the steel bar market is illustrated by the booking of an order for 1000 tons of concrete reinforcing bars, which sometimes are sold at a concession, at 1.50c., Pittsburgh, the chief concern of the buyer being to obtain satisfactory delivery. A fair volume of bar business is still coming to the mills despite the fact that many buyers covered prior to the advance. Bar iron makers have stiffened their quotations and 1.45c. to 1.50c., Pittsburgh, is now being quoted and obtained.

Sheets.—While there is little business in sheets at the new prices, 2.40c. for blue annealed, 3.15c. for black and 4.15c. for galvanized, base, Pittsburgh, a few consumers who did not cover prior to the advance have placed orders for small lots and the market seems firmly established at the new level. Tin plate is also firmer and \$4.75 per base box, Pittsburgh, is generally quoted, though on large tonnages less might be done.

Bolts and Nuts.—Prices are firmer. On large machine bolts it is now difficult, if not impossible, to obtain discounts greater than 70 and 10 per cent off list.

Wire Products.—The Cambria Steel Co. has followed the lead of other companies in advancing wire nails and some other wire products \$2 a ton. Plain wire remains unchanged.

Warehouse Business.—Orders for steel out of stock show a slight increase each week. Prices quoted for local delivery are as follows:

Soft steel bars and small shapes, 2.36c.; iron bars (except bands), 2.36c.; round edge iron, 2.55c.; round edge steel, iron finish, $1\frac{1}{2}$ x $1\frac{1}{2}$ in., 2.55c.; round edge steel planished, 3.39c.; tank steel plates, $\frac{1}{4}$ -in. and heavier, 2.46c.; tank steel plates, 3/16-in., 2.61c.; blue annealed steel sheets, No. 10 gage, 3.25c.; black sheets, No. 28 gage, 4c.; galvanized sheets, No. 28 gage, 5c.; square twisted and deformed steel bars, 2.50c.; structural shapes, 2.46c.; diamond pattern plates, $\frac{1}{4}$ -in., 4.35c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3c.; squares and hexagons, cold-rolled steel, 3.50c.; steel hoops, No. 13 gage and lighter, 3.11c.; steel bands, No. 12 gage to 3/16-in., inclusive, 2.88c.; iron bands, 3.90c.; rails, 2.36c.; tool steel, 8c.; Norway iron, 5.50c.; toe-calk steel, 4.50c.

Old Material.—There has been a general advance in scrap prices during the past few days. Scrap dealers anticipate a large increase in the consumption of scrap, should the scarcity of coke make it difficult for steel companies and foundries to obtain sufficient pig iron. A leading Pittsburgh interest, it is reported here, may come into the market shortly for a very large tonnage of steel scrap. A nearby steel plant bought 1000 tons of steel scrap last week at \$14 and dealers are now asking \$15. Low phosphorus crop ends have been sold at \$20.50, delivered, and higher prices have been quoted on pending inquiry. Steel pipe has been sold at \$14, delivered. No. 1 forge fire at \$11.50, blast furnace borings and turnings at \$11 to \$11.50 and No. 1 yard wrought has brought as high as \$14.50. Sales of steel scrap have been made by Eastern dealers for shipment to Pittsburgh at \$16.50 and higher. One dealer here is asking \$18, Pittsburgh. We quote for delivery at consuming points in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	\$14.00 to \$15.00
Scrap rails	14.00 to 15.00
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	20.50 to 21.00
Cast iron car wheels	15.75 to 16.25
No. 1 railroad wrought	16.00 to 16.50
No. 1 yard wrought	14.50 to 15.00
No. 1 forge fire	11.50 to 12.00
Bundled sheets (for steel works)	11.50 to 12.00
No. 1 busheling	13.00 to 14.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	11.00 to 11.50
Mixed borings and turnings (for blast furnace use)	11.00 to 11.50
Mach ne-shop turnings (for rolling mill and steel works use)	12.00 to 12.50
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mills)	12.00 to 12.50
Cast borings (for chemical plants)	15.00 to 16.00
No. 1 cast	17.00 to 17.50
Railroad grate bars	14.00 to 14.50
Stove plate (for steel plant use)	14.00 to 14.50
Railroad malleable	12.50 to 13.00
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	18.50 to 19.00

Cleveland

CLEVELAND, April 11.

The spread of the coal miners' strike to the non-union Connellsville district has caused considerable anxiety among blast furnace interests that use Connellsville coke. Virtually no furnace coke is being shipped into this territory from the Connellsville district and unless the situation improves shortly, some furnaces may be compelled to bank within a few days. Companies operating by-product coke plants are generally better situated, as most of them have good stocks of coal.

Iron Ore.—With rail rates on ore, both from the mines to the upper lake docks and from the lower lake ports to the furnaces still in doubt and with a possibility of a reduction in both, the outlook is not promising for an early establishment of prices or for more than a very light movement of ore until the Interstate Commerce Commission removes the uncertainty regarding rail rates. Another unfavorable factor in the situation is the possibility that the coal strike may compel some of the furnaces to bank. A number of consumers are lining up their season's requirements with the mining companies with which they are associated, but further than this no reservations of ore are reported and some of the leading selling agencies as yet have not received a single inquiry for ore from merchant furnaces. Some of the consuming interests

are arranging to take a great deal more ore than they did last year and mining operations are being kept up at the increased rate established several weeks ago. Ore shipments from docks showed a marked gain in March and have further increased this month. Dock shipments during March amounted to 410,627 tons as compared with 166,507 tons during February and with 320,871 tons during March of last year. On April 1 there was 7,680,763 tons of ore on the docks as compared with 8,379,869 tons the same date a year ago.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, \$6.45; Old range non-Bessemer, $51\frac{1}{2}$ per cent iron, \$5.70; Mesabi Bessemer, 55 per cent iron, \$6.20; Mesabi non-Bessemer, $51\frac{1}{2}$ per cent iron, \$5.55.

Pig Iron.—The coal strike has stimulated the pig iron market, both the foundry and steel making grades. The probability that some furnaces may have to bank because of the extension of the strike to the Connellsville district has resulted in some demand for basic iron. Prices have stiffened on all grades. A Cleveland consumer that may be forced to bank its furnaces has purchased 10,000 tons of basic iron from a local furnace at \$19 at furnace. A Valley producer has sold 2000 tons of basic iron to a Pittsburgh consumer at \$18.40 and declined to take an additional 2000 tons at \$18.50 which is now regarded as the minimum price for basic iron. Prices on foundry iron during the week advanced from 50c. to \$1 per ton because of the danger of curtailing production and sales of foundry iron in small lots were made to-day at \$20 by Valley and Buffalo furnaces. Owing to the advancing market, there was rather a wide range in the actual selling price during the week. On out of town business, a Cleveland producer sold foundry iron at \$18.50, but later made sales at \$19.25 and for Cleveland delivery booked some business at \$20. One leading interest has virtually withdrawn from the market because of the fuel situation. Another sold 15,000 tons in lots up to 2000 tons during the week and another lake furnace booked considerable tonnage in lots up to 1000 tons. Some sales were made for the third quarter delivery, but only one producer is booking business for beyond the second quarter. Sales of three lots of Bessemer iron aggregating 3000 tons were made by a Valley producer at \$20 and several lots of low phosphorus iron aggregating 1150 tons brought \$30. The advancing prices brought out considerable business in Southern iron. A local sales agency reports sales aggregating 4000 to 5000 tons, including 1500 tons taken by the Standard Sanitary Mfg. Co. for its Louisville plant. These sales were made at \$15.50, Birmingham. However, all Southern producers with one exception have apparently marked prices up to \$16.

Quotations below are f.o.b. local furnace for Northern foundry iron not including a 56c. switching charge. Other quotations are delivered Cleveland, being based on a \$1.96 freight rate from Valley points, a \$3.36 rate from Jackson and a \$6.67 rate from Birmingham:

Basic	\$19.96
Northern No. 2 fdy., sll. 1.75 to 2.25	\$19.50 to 20.00
Southern fdy., sll. 1.75 to 2.25	22.17 to 22.67
Ohio silvery, sll. 8 per cent	30.86
Standard low phos., Valley furnace	30.00 to 31.00

Semi-Finished Steel.—A Canton mill which is planning to resume operations has an inquiry out for several thousand tons of sheet bars. The market is firm at the recent price advance. The McKinney Steel Co. will start up its steel plant May 1, operating four open-hearth furnaces.

Finished Iron and Steel.—A heavy tonnage in steel bars, plates and structural material was booked during the week and the market is now firmly established at 1.50c. One or two mills show a disposition to ask high prices for small lots for quick shipment and one has already quoted 1.60c. for steel bars. With good order books and with the uncertainty as to the future in respect to the fuel situation, some mills have withdrawn prices and are making quotations only for immediate acceptance, so that should there be danger of having to curtail operations because of the coal shortage, they will be able to withdraw quickly from the market. Some consumers are showing an anxiety over the situation and are asking the mills if there is any danger of their steel shipments being shut off. Railroad buying has become more active in this territory. The Nickel Plate Railroad has placed 12,000

tons of rails, 8000 with the Illinois Steel Co.; 3000 with the Lackawanna Steel Co.; and 1000 tons with the Inland Steel Co.; and about 1500 tons of tie plates with the Illinois Steel Co. The Lima Locomotive Corporation has taken 40 switch locomotives for the New York Central and 10 for the Chicago, Burlington & Quincy Railroad. The Big Four received bids April 10 for 900 tons of tank plates and 100 tons of boiler and fire box plates. Bids ranged from 1.50c. to 1.70c., Pittsburgh. The Cleveland Railway Co. has placed 2000 tons of rails with the Lorain Steel Co. A local car repair shop placed 600 tons of plates. A new inquiry for 800 tons of plates has come out for oil tanks and an Eastern manufacturer of oil field equipment is in the market for 1200 tons. Considerable business is still coming from the automotive field. Orders reported include 400 tons of rim steel. An Eastern mill has advanced its price on boiler plates \$2 per ton to 1.75c. base. In structural lines the Fort Pitt Bridge Works has taken 475 tons for the National Deposit Bank, Brownsville, Pa. A new inquiry is out for 1200 tons for an apartment building in Cleveland. New bids will be taken for the plant of the Sandusky Cement Co., Cleveland, requiring 700 tons. Bids have been taken for 200 tons for school at New Washington, Ohio. One manufacturer has advanced hard steel reinforcing bars \$2 a ton to 1.50c. The Ford Motor Co. has placed approximately 6000 tons of blue annealed sheets for April and May shipment. Prices are firm at the \$3 ton advance, but business placed during the week was mostly at the old price on quotations made before the advance. The Cleveland Steel Co. has advanced prices \$2 per ton to 1.75c. on light plates or equivalent to 2.10c. for No. 10.

Jobbers quote steel bars, 2.21c.; plates and structural shapes, 2.46c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.56c.; No. 28 black sheets, 3.75c.; No. 28 galvanized sheets, 4.75c.; No. 10 blue annealed sheets, 3.06c. to 3.10c.; hoops and bands, 2.56c.; cold-rolled rounds, 3.25c.; flats, squares and hexagons, 3.75c.

Bolts, Nuts and Rivets.—Orders for bolts and nuts continue to show a gain and some of the local manufacturers have increased plant operations. Railroads as well as other consumers are buying more freely. The market is growing firmer and regular quotations are being more generally adhered to. While there has been some talk of price advances, it seems improbable that any advance will be made in the immediate future. Rivet sales have increased considerably and the tone of the market is firm. The leading local manufacturer is adhering to 2.10c. for structural and 2.20c. for boiler rivets. A new inquiry has come from a Southern car shop for 250 tons of rivets.

Coke.—Foundries have laid in a good supply of coke during the past few weeks and will not run short of fuel for some time. Connellsville foundry coke is being offered at \$4.50 to \$4.75 at oven subject to ability to ship, but little business is being booked. Indianapolis by-product furnace coke is being offered at around \$6.

Old Material.—Prices have further advanced 25c. on heavy melting steel and on a few other grades and the market is very firm. Mills are not actively in the market, but are buying some scrap in small lots. There is a fair volume of trading between dealers mostly in the open-hearth grades to fill orders for shipment to the Youngstown district.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	\$13.75 to \$14.25
Steel rails under 3 ft.	14.25 to 14.50
Steel rail's, rerolling	16.50 to 17.00
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	14.75 to 15.00
Cast borings	10.75 to 11.00
Machine shop turnings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
Compressed Steel	11.25 to 11.75
Railroad wrought	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Light bundled sheet stampings	9.00 to 10.00
Steel axle turnings	11.50 to 11.75
No. 1 cast	15.50 to 16.50
No. 1 busheling	10.00 to 10.50
Drop forge flashings over 10 in.	10.75 to 11.00
Drop forge flashings under 10 in.	11.00 to 11.25
Railroad grate bars	13.25 to 13.50
Stove plate	13.50 to 13.75
Pipes and flues	11.00 to 11.50

Cincinnati

CINCINNATI, April 11.

Pig Iron.—Fair activity again characterized the market last week, although the Cincinnati district proper did not show the same improvement as was evident in other districts. Sales, however, are becoming larger and while the inquiries are not improving greatly, sellers find it easier to work up deals. Included in sales last week was one of 2000 tons to an Indiana malleable shop, the tonnage going to lake furnaces on the basis of \$18.50. A Cincinnati melter bought approximately 500 tons of Northern iron on a \$19, Ironton, base, and several other sales of 100-ton lots on the same basis were reported in the immediate territory. There was some activity in Southern irons, a Tennessee melter booking 1500 tons and a Kentucky melter a similar tonnage. An Indiana melter is also reported to have closed on a round tonnage of Southern iron for second quarter delivery, and a Michigan stove manufacturer 1000 tons. All of these sales were made on a \$15.50, Birmingham, base, and while two Southern furnaces have advanced to \$16.50, and another has withdrawn from the market, \$15.50 apparently represents the market to-day. Silvery irons are moving in good volume and two sales aggregating 1100 tons are reported at the regular schedule. There is no demand for basic. Inquiries include one of 2000 tons of Southern for a radiator company, and an unnamed tonnage for a car equipment manufacturer. An Indiana manufacturer wants 300 tons of Northern, a Cincinnati melter a similar tonnage of Southern and the L. & N. Railroad 280 tons. An inquiry from the Pacific Coast calls for 6000 tons for second and third quarter, but so far few furnaces have expressed a desire to quote further ahead than July.

Based on freight rates of \$4.50 from Birmingham and \$2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	\$20.00 to \$20.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	20.50 to 21.50
Ohio silvery, 8 per cent sil.	30.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	21.52
Basic Northern	21.02
Malleable	21.52

Finished Material.—The possibility of interference with mill operations on account of the coal strike resulted in one of the leading independents on April 5 withdrawing its prices for the time being, and it is reported that several other independent producers will follow the lead taken. Business during the week continued at a rate slightly better than has been the case for the past few weeks. The sheet market particularly was active and it is said some mills have already booked sufficient orders to keep the mills running on a 75 per cent basis during the second quarter. While some of this business has been booked on the 3c. and 4c. basis, a number of orders taken during the week will carry the advanced prices. The possibility of the coal strike interfering with mill operations is now being discussed and people in close touch with the situation see a possibility of premium prices being paid in case the strike should extend over a protracted period. The market on bars, shapes and plates can now be considered firm at 1.50c., all protections at lower prices having been withdrawn on April 1. Several good inquiries are current. A car builder in this district is ready to place 7500 tons of steel required for 500 cars. The Tennessee Central Railroad is inquiring for 7000 tons of rails, 50 stock cars, 50 box cars and 300 composite coal cars. A tank manufacturer is in the market for approximately 1000 tons of plates, and an inquiry for 800 tons of reinforcing bars is expected to be placed during the week. The L. & N. Railroad has placed an order with the Cambria Steel Co. for 1050 steel hoppers and has also placed 1000 composite coal cars with the Chickasaw Shipbuilding & Car Co. The Big Four will open bids this week on its second quarter requirements of steel, bolts and nuts, axles, etc., the largest item calling for 900 tons of plates. In the structural field, the principal award was the Business Men's Club at Cincinnati. The American Bridge Co. mill fabricated 625 tons of steel for this building, and 800 tons of reinforcing bars will also be required. An auditorium at Chattanooga involving 900

tons will be up for bids this week, and the North High School at Columbus involving 600 to 1000 tons will be up about April 15. The Stacey Mfg. Co., Cincinnati, has been awarded a 2,000,000 cu. ft., 4-lift gas holder at Joliet, Ill., involving 1200 tons of steel and has also been awarded the coal bunkering and coal handling equipment at the Gibson Hotel in Cincinnati. The Stine Construction Co. is low bidder on a highway bridge over the White River in Indiana, involving 685 tons of steel, and Yeager & Sons, Danville, Ill., are low bidders on the general contract for the First National Bank at Richmond, Ind. New bids are to be taken for the Y. M. C. A. building at Middletown. The Belknap warehouse at Louisville will probably be awarded on May 1, as new bids are now being taken. The wire market is showing increased activity and nails are moving fairly well. Prices on wire products are stiffening somewhat, the former quotation of 2.40c. mill, having practically disappeared. Plant operations will be the same as last week, with the exception that the American Rolling Mill Co. has fired another open hearth at Ashland plant and has also placed another sheet mill in operation.

Warehouse Business.—Local jobbers report business as steadily improving, and with the possibilities of interference with mill shipment due to the coal strike, are looking forward to greatly increased orders. Structural steel and reinforcing bars are in brisk demand and wire products also are moving better. Prices are firm and unchanged.

Iron and Steel.—Iron and steel bars, 2.60c. base; hoops and bands, 3.20c. base; shapes and plates, 2.70c. base; reinforcing bars, 2.67½c. base; cold rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; common wire nails, \$2.75 per keg base; No. 9 annealed wire, \$2.60 per 100 lb.

Coke.—There is little activity in foundry coke, and furnace coke in the Connellsburg field is apparently off the market. The coal strike is expected to have some effect within three weeks, but so far prices have not been changed. Wise County and Pocahontas ovens are operating, but the New River producers are closed tight.

Old Material.—Inquiries are more numerous in the scrap market, and prices are advancing, the whole list being at least \$1 higher than last week. Blast furnace materials are in particularly good demand, and more interest is being shown in foundry grades.

We quote dealers' buying prices, f.o.b. cars:

Per Gross Ton

	<i>Per Gross Ton</i>
Bundled sheets	\$6.00 to \$6.50
Iron rails	13.00 to 13.50
Relying rails, 50 lb. and up	26.00 to 26.50
Rerolling steel rails	11.50 to 12.00
Heavy melting steel	11.00 to 11.50
Steel rails for melting	11.00 to 11.50
Car wheels	13.50 to 14.00

Per Net Ton

No. 1 railroad wrought	10.50 to 11.00
Cast borings	5.50 to 6.00
Steel turnings	4.00 to 4.50
Railroad cast	13.50 to 14.00
No. 1 machinery	15.50 to 16.00
Burnt scrap	9.00 to 9.50
Iron axles	17.50 to 18.00
Locomotive tires (smooth inside)	10.50 to 11.00
Pipes and flues	5.00 to 5.50

Birmingham

BIRMINGHAM, ALA., April 11.

Pig Iron.—Birmingham iron base is at \$16 minimum. The Alabama Co. and Central Coal & Iron Co. have advanced to \$16.50, and the only merchant iron maker under that base to-day sold a large tonnage of basic at \$15.50. This makes \$16 foundry base minimum with some quoting \$16.50. The Sloss-Sheffield Steel & Iron Co. to-day relighted fires in its North Birmingham furnace and will be making iron there by Monday. Recent heavy spot orders caused resumption. The Sloss-Sheffield Steel & Iron Co.'s northern Alabama iron going to St. Louis and Chicago markets by rail and water made large bookings and all-rail iron was also booked. Milwaukee consumers took lots of 100 and 1200 tons and a St. Louis stove maker took 1000 tons. The Southern Pacific Railroad took 500 tons and several lots went to the Pacific Coast. It is doubtful if there are 15,000 tons

of unsold second quarter iron at present producing capacity and furnace interests are still feeling their way to further resumption carefully. Stocks on yards made a big plunge downward in March. Stocks on March 1 and April 1 compared were as follows: Foundry, 73,000 and 59,000 tons; machine cast, 38,000 and 28,000; warrens, 700 and 660; basic, 21,000 and 17,000; totals, 134,000 and 105,000. Only one company has more than 10,000 tons on yards and only three as much as 5000 tons. The tendency to advance was marked toward the close of the week after realization of the strategical strength of the market. Pipe makers appear to have gotten requirements for the time being and were not in the market last week. Bookings involved a much smaller tonnage.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	\$16.00
Basic	15.00
Charcoal, warm blast	30.00

Finishing Mills.—The Tennessee company resumed at the structural mill at Fairfield, operating a double turn, the blooming mill resuming also, but on single turn. Steel production continued at capacity. It is believed the company will blow in No. 2 Ensley stack in May, when it is completed. It will have capacity of 550 tons. Steel sheets have been extremely active in the South in an effort of buyers to cover against the advance. Steel pipe for lumber mills has also been active. Structural steel gathered strength with the recent advance in prices.

Coal and Coke.—The first week of the mine strike witnessed none in Alabama. All mines continued at work and there was no indication of trouble to come. Production has eased up a little on account of heavy stocking up prior to the strike call. Coke is firm at \$5 to \$5.25.

Cast Iron Pipe.—Cast iron pipe advanced Monday to a base of \$34.50 for 6-in. and over with \$4 extra for 4-in.; \$10 extra for 3-in. and \$3 extra for gas pipe.

Old Material.—Scrap is stronger and cast grades have begun bringing more than the quoted price for new customers. General marking up has not taken place, but will follow firming up of iron market at \$16.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	\$12.00 to \$13.00
No. 1 steel	11.00 to 12.00
No. 1 cast	14.00 to 15.00
Car wheels	13.00 to 14.00
Tramcar wheels	12.00 to 13.00
No. 1 wrought	11.00 to 12.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Buffalo

BUFFALO, April 11.

Pig Iron.—Three furnaces are out of the market and at least two of the three will not be selling factors again before the beginning of the third quarter. Considerable business was offered Buffalo furnaces last week, one interest having inquiries aggregating 20,000 tons but unable to quote. Owing to a sufficient supply of coal and coke, the coal strike is not yet a serious factor with any of the furnace interests. Quotation of \$20 on No. 2 plain iron rules and very little iron is to be had at that price. The last furnace to make announcement that it was finished as a selling factor for the present, booked about 20,000 tons at prices ranging from \$18.50 to \$19. In one or two instances \$18.25 was made, but there were desirable circumstances governing this departure. Radiator interests were out to buy before the furnaces withdrew and several 5000-ton inquiries and many 2000 and 1000-ton lots were sought.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sif	\$21.00
No. 2X foundry, 2.25 to 2.75 sif	20.50
No. 2 plain, 1.75 to 2.25 sif	20.00
Basic	18.50
Malleable	19.00
Lake Superior charcoal	26.14

Finished Iron and Steel.—The local sales agency of one of the largest independents, acting under orders from its main office, has withdrawn from the market

on all commodities. The last sale was made Wednesday, April 5, and a number of large tonnages were turned down when the decision was reached. Most of the business was for 100-ton lots and upward. Another organization having a branch here, while not withdrawn, is not pushing for business vigorously. Bars and sheets have been in especial demand and several sellers are not keen to take some of the available business at 1.50c. The leading bar maker has booked considerable tonnage and the present basis of operation includes five open hearths with a sixth to go in about April 15. A blooming mill and three bar mills are also in operation. The sheet interest which booked a big tonnage in advance of price increases has started operation on a 75 per cent basis. Sheet prices are firm at 2.40c. for No. 10 blue annealed and 3.15c. for No. 28 black. Wire demand has increased and the largest wire mill is going at 85 per cent of normal operation. Structural business alone remains dull. Seasonal activity has not come out and a number of large projects have not developed to the bidding stage. The Kellogg Structural Steel Co. will fabricate 200 tons for the South Junior High School at Niagara Falls.

Warehouse Business.—Transactions continue to increase in number and tonnage. Sheets have been especially strong and as a comparative proposition, April business to date has been greater than in any like period in 1921. Some business has developed out of anxiety with reference to the coal situation and immediate delivery is a factor in most sales.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 2.50c.; plates, 2.50c.; soft steel bars and shapes, 2.40c.; hoops, 3.15c.; bands, 3c.; blue annealed sheets, No. 10, 3.40c.; galvanized steel sheets, No. 28, 5.25c.; black sheets, No. 28, 4.25c.; cold-rolled strip steel, 5.65c.; cold-rolled round shafting, 3.20c.

Old Material.—Railroad lists closed last week at exceptionally high figures; heavy melting steel on the New York Central list being bid at \$17, Youngstown, and on the Erie list, \$17.30, Youngstown. Dealers were very active. Strong demand for turnings and borings, low phos., and No. 1 machinery cast developed and some large sales in the last two named products were made.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	\$14.50 to \$15.00
Low phos., 0.04 and under	17.50 to 18.50
No. 1 railroad wrought	16.00 to 16.50
Car wheel's	16.00 to 16.50
Machine shop turnings	9.50 to 10.00
Cast iron borings	10.50 to 11.50
Heavy axle turnings	12.50 to 13.00
Grate bars	12.00 to 13.00
No. 1 busheling	12.00 to 12.50
Stove plate	14.00 to 15.00
Bundled sheet stampings	9.00 to 10.00
No. 1 machinery cast	17.00 to 17.50
Hydraulic compressed	12.00 to 12.50
Railroad malleable	13.00 to 14.00

Boston

BOSTON, April 11.

Pig Iron.—The local pig iron market the past week was more active and excited than it has been before since war days. Sales for that period are estimated at around 18,000 tons, including approximately 8000 tons of No. 2 plain to the H. B. Smith Co., Westfield, Mass., heaters, and 2500 tons of malleable to a Connecticut melter. The Westfield concern had not planned on buying iron until after a new wage agreement was made with molders, the present agreement not expiring for several days. Its inquiry started other foundries buying, whereupon the supply of iron began to diminish because of furnaces withdrawing from the market, and prices to advance. One Buffalo furnace turned down practically 7000 tons, advanced its price from \$18 to \$20, furnace, and withdrew from the market, being sold up to July 1. Another Buffalo furnace advanced its price from \$18 to \$20, furnace, and is practically out of the market, having turned down 1000 tons since then. An eastern Pennsylvania furnace heretofore offering iron at \$19, furnace, sold 1000 tons at close to \$19.50, and then advanced its price to \$20. Others quoting \$20 furnace base secured 50c.

a ton better on some sales, and still others sold No. 2X at \$21. Eastern Pennsylvania irons have grown comparatively scarce. Nothing authentic regarding prices paid by the H. B. Smith Co. is available, but indications are it paid around \$20 and better for most of its iron. Local furnace representatives are apprehensive of the future because of conditions that may arise from the coal strike situation. Almost no Virginia iron is available, and with the supply of Pennsylvania and Buffalo limited, greater activity is expected in Alabama.

We quote delivered at common New England points as follows, having added to furnace prices \$4.06 freight from eastern Pennsylvania, \$5.46 from Buffalo, \$6.55 from Virginia and \$10.66 from Alabama:

East. Penn., sll. 2.25 to 2.75	\$24.56 to \$25.00
East. Penn., sll. 1.75 to 2.25	24.06 to 24.50
Buffalo, sll. 2.25 to 2.75	25.90
Buffalo, sll. 1.75 to 2.25	25.40
Alabama, sll. 2.25 to 2.75	26.66 to 27.16
Alabama, sll. 1.75 to 2.25	26.16 to 26.66
Virginia, sll. 2.25 to 2.75	29.58
Virginia, sll. 1.75 to 2.25	29.08

Warehouse Business.—Aside from an advance in cold rolled rounds from \$3 to \$3.30 per 100 lb., and in squares, hexagons and flats from \$3.50 to \$3.80, and a subsequent drop to the original basis, warehouse prices on iron and steel have remained unchanged. An advance in sheets and wire nails to conform with new prices made by mills is impending, however. Business continues to expand, due to a greater number of small orders coming to hand daily. The purchase of two tons of bolts and nuts by the city of Boston last week represents the largest individual transaction recorded.

Jobbers quote: Soft steel bars, \$2.40 $\frac{1}{2}$ per 100 lb. base; hats, \$3.05 $\frac{1}{2}$; concrete bars, \$2.20 to \$2.68; structural steel, \$2.40 $\frac{1}{2}$ to \$2.50 $\frac{1}{2}$; tire steel, \$3.85 to \$4.25; open-hearth spring steel, \$4 to \$5.50; crucible spring steel, \$11.50; steel bands, \$2.90 $\frac{1}{2}$ to \$3.53; hoop steel, \$3.31 $\frac{1}{2}$; cold rolled steel, \$3 to \$3.50; refined iron \$2.40 $\frac{1}{2}$; best refined iron, \$1.25; Wayne iron, \$5.50; Norway iron, \$5.50; plates, \$2.65 $\frac{1}{2}$ to \$2.83; No. 10 blue annealed sheets, \$3.48 per 100 lb. base; No. 28 galvanized sheets, \$5.50.

Finished Iron and Steel.—The Boston & Maine Railroad has placed an order for 65 passenger coaches, twenty smoking cars, eight combination baggage and smoking cars, and five combination mail and baggage cars, a total of 98 semi-steel cars, with the Osgood-Bradley Car Co., Worcester, Mass., at a contract price of about \$2,000,000, and for 25 milk cars with the Laconia Car Co., Laconia, N. H., valued at more than \$200,000. Bids are in on the company's rail requirements, and figures have been taken on 2900 kegs of spikes. Other New England railroads are not buying much of anything just now. Bids have been asked on 800 to 1000 tons structural beams for the Boston-Chelsea bridge. The Boston Transit Commission has awarded 920 tons structural steel to the Boston Structural Steel Co., Inc., Cambridge, Mass., for the East Boston loop. Bethlehem steel will be used. The A. C. Harvey Co., Boston, was the low bidder on 500 tons reinforcing bars and 75 tons of small shapes for the same job. The Corrugated Bar Co. is awarded 300 tons of bars for road work in Massachusetts.

Coke.—Further free covering of last half by-product foundry contract coke by iron melters at prices ruling at date of shipment is noted by the producers in this territory. Day to day shipments against first half contracts are running slightly ahead of those for the previous week and far in excess of those for the corresponding time last year, which is taken as an indication that foundries are gradually increasing their melts or stocking additional tonnages in the belief that the coal strike will last longer than generally anticipated. Both the New England Coal & Coke Co. and the Providence Gas Co. continue to quote spot foundry coke at \$10.50 delivered and contract at \$10.25, where the local freight does not exceed \$3.40.

Old Material.—The movement of old material out of New England into Pennsylvania has greatly increased, shipments of heavy melting steel, blast furnace borings and turnings, forged scrap and bundled skeleton being freer than noted before in many months. As a result there has been a pronounced stiffening in local prices, especially on those materials most in demand. The call for chemical borings also has increased, notwithstanding a further rise in asking prices. Some dealers

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Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	\$0.36	Kansas City	\$0.815
Philadelphia, export	0.265	Kansas City (pipe)	0.77
Baltimore, domestic	0.35	St. Paul	0.665
Baltimore, export	0.255	Omaha	0.815
New York, domestic	0.38	Omaha (pipe)	0.77
New York, export	0.285	Denver	1.35
Boston, domestic	0.405	Denver (wire products)	1.415
Boston, export	0.285	Pacific Coast	1.665
Buffalo	0.295	Pacific Coast, ship plates	1.335
Cleveland	0.24	Birmingham	0.765
Detroit	0.325	Memphis	0.43
Cincinnati	0.325	Jacksonville, all rail	0.555
Indianapolis	0.345	Jacksonville, rail and water	0.46
Chicago	0.38	New Orleans	0.57
St. Louis	0.475		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, \$1.; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 1.50c.

Sheared plates, ¼ in. and heavier, tank quality, 1.40c. to 1.50c.

Wire Products

Wire nails, \$2.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.25 and shorter than 1 in., \$1.75; bright Bessemer and basic wire, \$2.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$2.25; galvanized wire, \$2.75; galvanized barbed wire, \$3.15; galvanized fence staples, \$3.15; pointed barbed wire, \$2.65; polished fence staples, \$2.65; cement-coated nails, per count keg, \$2.; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 70½ per cent off list for carload lots; 69½ per cent for 1000-rod lots, and 68½ per cent for small lots, f.o.b. Pittsburgh.

Bolts and Nuts

Machine bolts, small, rolled threads,

70, 10 and 10 per cent off list

Machine bolts, small, cut threads

70 and 10 per cent off list

Machine bolts, larger and longer

70 and 10 per cent off list

Carriage bolts, ¾ in. x 6 in.:

Smaller and shorter rolled threads

70 and 10 per cent off list

Cut threads

70 per cent off list

Longer and larger sizes

70 per cent off list

Lag bolts

70, 10 and 5 per cent off list

Plow bolts, Nos. 1, 2 and 3 heads

60 and 10 per cent off list

Other style heads

20 per cent extra

Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:

Smaller and shorter

65, 10 and 5 per cent off list

Larger and longer sizes

65 and 10 per cent off list

Hot pressed sq. or hex. blank nuts

\$5.50 off list

Hot pressed nuts, tapped

\$5.25 off list

C.p.c. and t. sq. or hex. blank nuts

\$5.25 off list

C.p.c. and t. sq. or hex. blank nuts, tapped

\$5.00 off list

Semi-finished hex. nuts:

1¼ in. to 9/16 in. inclusive

80, 10, 10 and 10 per cent off list

Small sizes S. A. E.

80 and 10 per cent off list

¾ in. to 1 in. inclusive, U. S. S. and S. A. E.

70, 10, 10 and 10 per cent off list

Stove bolts in packages

80 and 3 tens per cent off list

Stove bolts in bulk

80, 3 tens and 2½ per cent off list

Tire bolts

70, 10 and 5 per cent off list

Track bolts, carloads

3c. to 3.25c. base

Track bolts, less than carloads

3.75c. to 4c. base

Upset Square and Hex. Head Cap Screws

1 in. and under

80 and 10 to 80, 10 and 10 per cent off list

9/16 in. to ¾ in.

80 and 10 to 80, 10 and 10 per cent off list

Upset Set Screws

1 in. and under

80, 10 and 5 to 85 per cent off list

9/16 in. to ¾ in.

80, 10 and 5 to 85 per cent off list

Milled Square and Hex. Cap Screws

All sizes

75 and 10 to 80 per cent off list

Milled Set Screws

All sizes

70, 10 and 10 per cent off list

Rivets

Large structural and ship rivets..... \$2.10
Large boiler rivets..... 2.20
Small rivets..... 75 and 10 off list

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$38; chain rods, \$48; screw stock rods, \$43; rivet and bolt rods and other rods of that character, \$38; high carbon rods, \$45 to \$48, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, \$2.15 to \$2.25 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, 1/2-in., 3/8-in. and 7/16-in., \$2.50 base; 5 1/16-in., \$2.50 base. Boat and barge spikes, \$2.50 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, \$3 to \$3.25 base per 100 lb. Tie plates, \$1.75 per 100 lb. Angle bars, \$2.40 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$9.30 per package; 8-lb. coating, I. C., \$9.60; 15-lb. coating, I. C., \$11.30; 30-lb. coating, I. C., \$13; 25-lb. coating, I. C., \$14.25; 35-lb. coating, I. C., \$15.25; 40-lb. coating, I. C., \$16.25; 40-lb. coating, I. C., \$17.25 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars, 1.50c. from m.l. Refined bar iron, 2c. to 2.10c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Inches	Steel	Butt Weld		Iron
		Black	Galv.	
1/8	5 1/2	23	1/4 to 3/8	3 1/2 + 2 1/2
1/4 to 5/8	60	33 1/2	1/2	36 1/2 + 18 1/2
1/2	65	50 1/2	5/8	42 1/2 + 27 1/2
5/8	69	56 1/2	1 to 1 1/2	44 1/2 + 29 1/2
1 to 3	71	58 1/2		

Inches	Lap Weld	Butt Weld		Iron
		extra	strong, plain ends	
1/8	50 1/2	33	1/4 to 3/8	4 1/2 + 37 1/2
1/4 to 3/8	56	38 1/2	1/2	35 1/2 + 23 1/2
1/2	62	50 1/2	5/8	42 1/2 + 28 1/2
5/8	67	55 1/2	1 to 1 1/2	44 1/2 + 30 1/2
1 to 1 1/2	69	57 1/2		
2 to 3	70	58 1/2		

Inches	Lap Weld	Butt Weld, extra strong, plain ends		Iron
		extra	strong, plain ends	
1/8	62	59 1/2	2	40 1/2 + 27 1/2
2 1/2 to 4	66	54 1/2	2 1/2 to 4	43 1/2 + 31 1/2
4 1/2 to 6	65	53 1/2	4 1/2 to 6	42 1/2 + 30 1/2
7 to 8	61	47 1/2	7 to 8	35 1/2 + 23 1/2
9 to 12	55	41 1/2	9 to 12	30 1/2 + 18 1/2

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2 1/2 per cent.

Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron	
	1 1/2 in.	1 3/4 to 1 1/2 in.
1 1/4 in.	26 1/2	5
2 to 2 1/4 in.	41	15
2 1/2 to 3 in.	52	25
3 1/4 to 13 in.	57	30

To large buyers of steel tubes, a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

New discounts have been adopted on standard commercial seamless boiler tubes, but manufacturers are not yet ready to announce them for publication, and for that reason we publish no discounts this week.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

Cents per Lb.	Cents per Lb.
No. 8 and heavier	2.35
Nos. 9 and 10 (base)	2.49
Nos. 11 and 12	2.45

Box Annealed, One Pass Cold Rolled

Cents per Lb.	Cents per Lb.
Nos. 17 to 21	2.95
Nos. 22 to 24	3.00
Nos. 25 and 26	3.05
No. 27	3.10

Galvanized

Cents per Lb.	Cents per Lb.
Nos. 10 and 11	3.15
Nos. 12 to 14	3.25
Nos. 15 and 16	3.40
Nos. 17 to 21	3.55
Nos. 22 to 24	3.70

Tin-Mill Black Plate

Cents per Lb.	Cents per Lb.
Nos. 15 and 16	2.95
Nos. 17 to 21	3.00
Nos. 22 to 24	3.05
Nos. 25 to 27	3.10

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

Copper, New York	Straits		Lead		Zinc	
	Electro- lytic*	New York	New York	St. Louis	New York	St. Louis
April 5.....	12.75	12.50	29.50	4.95	4.75	5.15
6.....	12.75	12.50	29.37 $\frac{1}{2}$	5.00	4.80	5.17 $\frac{1}{2}$
7.....	12.87 $\frac{1}{2}$	12.62 $\frac{1}{2}$	29.87 $\frac{1}{2}$	5.00	4.80	5.22 $\frac{1}{2}$
8.....	12.87 $\frac{1}{2}$	12.62 $\frac{1}{2}$	30.75	5.00	4.80	5.25
10.....	12.87 $\frac{1}{2}$	12.62 $\frac{1}{2}$	30.50	5.00	4.80	5.27 $\frac{1}{2}$
11.....	12.87 $\frac{1}{2}$	12.62 $\frac{1}{2}$	30.50	5.00	4.80	4.92 $\frac{1}{2}$

*Refinery quotation.

New York

NEW YORK, April 11.

The copper market has turned strong in company with the other metals. Prices of tin have advanced in a quiet market. Quotations for lead have again moved forward and so have those for zinc, demand for both metals being active.

Copper.—Demand for copper, while not so brisk as in the early part of March, is still of fairly large proportions and prices have stiffened. There are inquiries in the market from four or five of the leading consumers, as well as from other sources. While several large producers will not quote electrolytic copper at less than 13c., delivered, there is still some metal available at 12.87 $\frac{1}{2}$ c., delivered, or 12.62 $\frac{1}{2}$ c., refinery, which is generally regarded to-day as the market. It is believed, however, that no large quantity is available at this price and that 13c., delivered, will soon prevail.

Tin.—The market has been quiet the past week, but very firm and prices have advanced not so much on the volume of transactions as because of higher prices in London and an advance in sterling exchange. There has been very little pressure to sell. Sales last Friday were in moderate amount, but aside from this, very little has been reported as to any volume of transactions, although there are reports that a good business was done on the quiet to consumers in the interior by some sellers. Spot Straits tin to-day is quoted at 30.50c., New York, while the London market has advanced each day this month, until to-day, when it stood at £150 5s. for spot standard, £151 15s. for future standard and £152 15s. for spot Straits, all £6 to £7 per ton higher than a week ago. Arrivals thus far this month have been 2905 tons, with 3845 tons reported afloat.

Lead.—The leading interest again advanced its price on April 7 from 4.80c. to 4.90c., St. Louis, and from 4.90c. to 5c., New York, the outside market having already reached these levels. Demand is good and the market is strong at these prices and the belief prevails that more business is being done by independents than by the leading interest.

Zinc.—The market for prime Western has continued to advance almost every day until for early or 30-day delivery the quotation ranges from 4.92 $\frac{1}{2}$ c. to 4.95c., St. Louis, or 5.27 $\frac{1}{2}$ c. to 5.30c., New York, with the tendency upward. For May and early June delivery the quotation is firm at 5c., St. Louis, or 5.35c., New York, at which level some business is reported. Two factors are prominent in the strength of the market, one being a better demand from galvanizers and the other a firm belief that England will have to come into this market in the near future. The statistical position, which is favorable, is also another factor.

Antimony.—Strength continues to predominate and wholesale lots for early delivery are quoted at 4.75c., New York, duty paid.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, for early delivery are quoted by the leading producer at 19c. to 19.10c., f.o.b. plant, while the same grade from importers is quoted a little higher at 18c. to 18.50c., New York, duty paid.

Old Metals.—The market is stronger in sympathy with the new metal market and the tendency is upward. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.50
Copper, heavy and wire	11.50
Copper, light and bottoms	9.50
Heavy machine composition	9.50
Brass, heavy	7.00
Brass, light	5.75
No. 1 red brass or composition turnings	8.00
No. 1 yellow rod brass turnings	6.25
Lead, heavy	4.25
Lead, tea	3.25
Zinc	3.00

Chicago

APRIL 11.—The market is firmer with a fair volume of buying of all the metals, including copper which has been the weakest. Tin, lead and zinc have advanced and copper is expected to go up. We quote in carload lots: Lake copper, 13c. to 13.25c.; tin, 31c. to 32c.; lead, 5c.; spelter, 5c.; antimony, 6c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 7.75c.; red brass, 7.25c.; yellow brass, 6c.; lead pipe, 3.50c.; zinc, 2.50c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 25c.; all buying prices for less than carload lots.

St. Louis

APRIL 11.—Both lead and zinc continue to advance. We quote lead, 4.65c. to 4.75c., carlots; slab zinc, 4.80c. to 4.90c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

Business Improving Along Ohio River

IRONTON, OHIO, April 10.—Conditions in the southern Ohio and northern Kentucky iron producing districts are showing considerable improvement. At Ashland, Ky., the American Rolling Mill Co. is now running at about 75 per cent of capacity. The company has one blast furnace in operation, three open hearths and four sheet mills and it is expected that within the next two weeks the finishing capacity at the mills will be running 100 per cent. The Ashland Steel Co. is operating at 75 per cent of capacity. General business conditions in the Ashland district are now almost back to normal and reports indicate that there is very little unemployment. In the Ironton district, while only one blast furnace is in operation, conditions are looking better; both nail plants are operating full time and have sufficient business on their books to keep them operating for the next two months. One furnace of the Marting Iron & Steel Co. was banked on April 3 after a six months' run and Sarah Furnace of the Kelly Nail & Iron Co. was blown out during the last week in March, after a three months' run.

In the Jackson and Wellston districts, while no furnaces are at present in blast, the demand for silvery irons is reported as showing much improvement. At Portsmouth, the Whitaker-Glessner furnace is hanging up new records with each week's operation. At the present time 12 sheet mills are in operation, running six days a week. Foundations have been completed for the new roll and wire mills and practically all of the steel for these buildings is now on the ground. The by-product coke plants at Ashland and Portsmouth are running full time, and the refractories makers in the district are averaging about 35 per cent. With general conditions in the iron and steel industry improving throughout the country, it is expected that within the next 60 or 90 days, a number of furnaces in the southern Ohio districts will resume operations. At the present time, the coal mines in the Hocking Valley are practically all closed on account of the strike, but little interference with iron and steel-making operations is expected, as non-union mines in West Virginia are expected to be able to take care of the coal requirements of the district.

British Iron and Steel Market

Home Demand Slack—Coke and Tin Plate Dearer
—Labor Dispute Raging—Continental

Quotations

(By Cable)

LONDON, ENGLAND, April 11.

Labor disputes are still unsettled.

Pig iron is quieter, owing to the approach of the (Easter) holidays, coupled with stagnation of home buying on account of engineering and shipbuilding labor troubles. Export buying is still maintained. Cleveland output is limited; low grade material is scarce and dearer. Hematite is dull. Home consumers are not interested and export buying is slow.

Germany and the United States have bought South Spanish ore. North African ore is being sold at 20s. to 21s. (\$4.40 to \$4.62) ex-ship Tees. Bilbao Rubio is nominally 26½ to 27s. (\$5.83 to \$5.94) ex-ship Tees.

Additional steel works are closing, owing to stagnation of home trade. Steel prices are firm, but iron is weaker. Scotch crown iron bars are quoted at £11 (2.16c. per lb.); Staffordshire marked bars, at £13 10s. (2.65c. per lb.).

The Continental market is dull. Prices are given in the table.

Tin plates are firmer on increased demand all around. Stock plates are being sold on 19½s. (\$4.35) basis, f.o.b. Option contracts for April and May are being sold at 19½s. (\$4.29) basis, f.o.b. Prompt sellers are asking up to 20s. (\$4.40) basis, f.o.b. The export business includes sales to Argentina, Canada, Germany and the Far East. Wasters are firm, 20 x 14's being 18s. (\$3.96) f.o.b., ex-stock.

Galvanized sheets are firm, with small, scattered business.

Japanese specifications of black sheets are in continued demand, sellers asking up to £16 (3.14c. per lb.) f.o.b., June.

Pig Iron Quiet and Lower—Exports Increasing— British Shipbuilders Going to Germany

LONDON, ENGLAND, March 22.—There is still no settlement in the two great industrial disputes now raging. In the engineering dispute the government have been asked to instigate an inquiry. In the shipbuilding dispute, however, various conferences have been held, but all efforts at peace so far have come to nought. It is to be hoped that both these questions will be settled before long as, besides causing further unemployment, it means a serious set-back to the steel trade generally.

Reports from Scotland state that several local shipbuilders and engineers have gone to Germany, being offered work by German shipbuilding firms, and they now state that they are quite satisfied with their position and are advising all their comrades in Scotland to join them, as they say they will be certain of getting a fresh start on that side.

Conditions in the pig iron market have been quieter during the past fortnight, which of course is only natural because demand from home consumers is practically nil, and likely to remain so while the industrial unrest lasts. On the other hand export business is being maintained and good shipments are being made to Germany. Makers have made no alterations in prices, so that No. 3 Cleveland G. M. B. remains at 90s f. o. b. with other grades at the present ruling extras or discounts. Hematite has been rather weaker because more furnaces have been started and output is in excess of current demand. It is possible to place orders for the last half of April at about 97s 6d for East Coast Mixed Numbers, which is 2s 6d cheaper than the officially quoted price.

Finished steel generally is quiet, though there is a fair demand for export, but not much business comes

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at \$4.40 per £1, as follows:

Durham coke, delivered £1	8½s. to £1	9s.	\$6.27 to	\$6.38
Cleveland No. 1 foundry	4 15		20.90	
Cleveland No. 3 foundry	4 10		19.80	
Cleveland No. 4 foundry	4 7½		19.25	
Cleveland No. 4 forge..	4 2½ to 4	5	18.15 to	18.70
Cleveland basic	4 10		19.80	
Hematite	7 0*		30.80*	
East Coast mixed....	5 0 to 5	2½	22.00 to	22.55
East Coast hematite...	4 17½ to 5	0	21.45 to	22.00
Ferrromanganese	15 0	& 14 10*	66.00 &	63.80*
Rails, 60 lb. and up....	8 0 to 9	10	35.20 to	41.80
Billets	7 10 to 8	0	33.00 to	35.20
Sheet and tin plate bars,				
Welsh	7 0 to 7	7½	30.80 to	32.45
Tin plates, base box....	0 19½ to 0	20	4.18 to	4.40
			C. per Lb.	
Ship plates	9 5 to 10	10	1.80 to	2.04
Boiler plates	13 10 to 14	0	2.65 to	2.72
Tees	9 10 to 11	0	1.85 to	2.14
Channels	8 15 to 10	5	1.70 to	1.99
Beams	8 10 to 10	0	1.65 to	1.94
Round bars, 3/4 to 3 in.	10 10		2.04	
Galvanized sheets, 24 g.	16 0 to 16	5	3.13 to	3.16
Black sheets	12 10 to 12	15	2.43 to	2.48
Steel hoops	12 0 & 12	5*	2.33 &	2.38*
Cold rolled steel strip,				
20 g.	23 10		4.56	
Cotton ties, Indian specifications	16 0		2.95	

*Export price.

Continental Prices, All F.O.B., Delivery as Specified

No. 3 foundry pig iron:				
Belgium, May	£4 17½s. to £5	0s.	\$21.45 to	\$22.00
Luxemburg, May....	4 17½	to 5 0	21.45 to	22.00
France, June	5 7½ to 5 10			
Billets:				
Continental, May, June	6 10*		28.60	
Merchant bars:			C. per Lb.	
Belgium, May, June.	8 0 to 8	10	1.57 to	1.67
Luxemburg, June....	8 12½	to 8 10	1.69	
Germany, June, July	8 0 to 8 10		1.57 to	1.67
France, May, June..	8 0 to 8 10		1.57 to	1.67
Joists (beams):				
France, April, May..	7 15		1.52	
Luxemburg, June....	7 12½ to 7 15		1.50 to	1.52
Belgium, May.....	7 7½		1.45	
1/2-in. plates:				
France, May, June..	8 0 to 8 5		1.57 to	1.62
5/8-in. plates:				
Germany, May, June	8 10 to 8 15		1.67 to	1.72

*Nominal.

to hand as our prices are still above those quoted by continental makers. On the other hand deliveries are very bad, and only a small amount of business is passing with this country. The steel works here are badly in need of orders for home specifications, but of course at the present time there is practically nothing coming forward.

E. D. Frohman, vice-president and Pittsburgh district manager, S. Obermayer Co., will be the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Pittsburgh, Monday evening, April 17. His subject is "Whys and Wherefores of High Temperature Cement." The nominating committee will report at this meeting, as will also a committee which has been considering whether the association should endorse a standard pig iron contract formulated by the National Association of Purchasing Agents.

A safety switch congress was held in Cleveland, April 8, under the auspices of the Cleveland section of the Association of Iron and Steel Electrical Engineers at the rooms of the Electrical League at the Statler hotel. About fifteen manufacturers of safety switches had exhibits and during the evening representatives of these manufacturers made talks in describing their equipment.

The Verona Steel Castings Co., Verona, Pa., after having been idle for a year, will start 100 per cent operations on the morning of May 1. The plant has been enlarged and improved so that it is now one of the most modern foundries in the United States. It will employ between 600 and 900 men.

PERSONAL

C. R. Sabin has been appointed manager of the Cleveland Engineering Society, Cleveland, to fill the vacancy caused by the resignation of George S. Black. Since his graduation from the department of civil engineers of the University of Michigan in 1918, Mr. Sabin has been engaged in civil engineering and construction work.

E. C. Reeder, for the past five years chief engineer of the Rosiclare Lead and Fluor Spar Mining Co., in charge of exploration, development and construction work at Rosiclare, Ill., has resigned to enter the service of the Hillside Fluor Spar Mines of the same place in a similar capacity. Mr. Reeder is a graduate of the Michigan College of Mines and has had an experience in metal and other mining work in the United States and Canada.

L. A. Touzalin, assistant superintendent blast furnaces, South Works, Illinois Steel Co., Chicago, has been appointed superintendent blast furnaces at Joliet Works, Joliet, Ill. Harry Strain succeeds Mr. Touzalin at South Works.

Howard Greene has resigned as assistant general superintendent Great Lakes Malleable Iron Co., Milwaukee, to become superintendent of the malleable foundries of the Walker Mfg. Co., Racine, Wis., manufacturer of automobile lifting jacks and kindred accessories.

Charles R. Hare, superintendent of production New Britain Machine Co., New Britain, Conn., screw machines, etc., has been made general superintendent.

Nelson J. Darling, assistant general manager General Electric Co., Erie, Pa., has been made manager of the company's Lynn, Mass., plant to succeed the late Richard H. Rice.

Theodore L. Dodd, 80 E. Jackson Blvd., Chicago, has been appointed western sales representative of the D. J. Crowley Co., Detroit, and will look after the sales of the Penn Seaboard Corporation, Philadelphia, Tacony Steel Co., Philadelphia, and Titusville Forge Co., Titusville, Pa.

George S. Barton, president and treasurer of the Rice, Barton & Fales Machine & Iron Co., Worcester, Mass., machinery manufacturer, will sail for Europe April 15 on a business trip.

Barton Steveson, who has been manager of both the power and the railway divisions of the Pittsburgh office, Westinghouse Electric & Mfg. Co., hereafter will devote his entire time to the power division and F. G. Hickling has been appointed manager of the railway division, these changes being due to a separation of the divisions. S. R. Shave has been appointed office manager of the price section of both divisions.

Arthur Mackay, formerly in charge of the Montreal branch of the Coates, Bennett & Reidenbach Co., Rochester, N. Y., is now with the Buffalo House Wrecking & Salvage Co., Buffalo, and will be assistant manager in the scrap department under Dan Roblin.

William J. Priestley, formerly steel superintendent naval ordnance plant, South Charleston, W. Va., has been appointed works manager, Pittsburgh Crucible Steel Co., Midland, Pa., succeeding H. P. Barnard, resigned, and has assumed his new duties. Prior to going to the naval ordnance plant, Mr. Priestley was a division superintendent at the Lehigh plant of the Bethlehem Steel Co. He was graduated from Lehigh University, class of 1908.

The names of the following, who are proposed for membership in the Iron and Steel Institute, appear on the voting list for the annual meeting in London, May 4 and 5: Reynolds C. Baldwin, Stanley Rule & Level Co., New Britain, Conn.; Louis J. Campbell, Electric Alloy Steel Co., Youngstown, Ohio; Henry J. Freyn, 645 People's Gas Building, Chicago; Marcus A. Grossman, Electric Alloy Steel Co., Charleroi, Pa.; J. Fletcher Harper, 291 Thirty-third Street, Milwaukee; Russell

C. Heaslett, Wheeling Mold & Foundry Co., Wheeling, W. Va.; Herman A. Holz, 17 Madison Avenue, New York; D. P. Hopkins, United States Cast Iron Pipe & Foundry Co., Philadelphia; Ralph Seymour Poister, United Alloy Steel Corporation, Canton, Ohio; Oscar Lee Pringle, Pittsburgh Crucible Steel Co., Midland, Pa.

Veryl Preston, who has maintained offices at 120 Broadway, New York, since he withdrew from the Cromwell Steel Co., Lorain, Ohio, has returned from a business trip to Germany.

The nominating committee of the American Foundrymen's Association appointed by the board of directors has unanimously nominated for officers and directors of the association the following: President, C. R. Messinger, Chain Belt Co., Milwaukee; vice-president, G. H. Clamer, Ajax Metal Co., Philadelphia. Directors for three years: C. B. Connelley, Commissioner of Labor and Industry, Harrisburg, Pa.; Fred Erb, Packard Motor Car Co., Detroit; C. E. Hoyt, American Foundrymen's Association, Chicago; L. W. Olson, Ohio Brass Co., Mansfield, Ohio; A. B. Root, Jr., Hunt-Spiller Mfg. Corporation, Boston.

George H. Southard has been made president J. & B. Mfg. Co., Pittsfield, Mass., electrical apparatus, etc., to succeed Edward B. Jacobson, recently resigned. H. R. Williams is director of sales.

Col. F. B. Richards of M. A. Hanna & Co., Cleveland, returned April 10 from Pinehurst, N. C., where he went about two months ago to recuperate from an attack of pneumonia.

Oliver Stubbs, managing director Joseph Stubbs, Ltd., Manchester, England, president Institute of British Foundrymen, and Thomas J. Firth, managing director, Brightside Foundry & Engineering Co., Sheffield, England, and former president Institute of British Foundrymen, will arrive in New York April 17 and will be met by a committee consisting of officers and former presidents of American Foundrymen's Association and tendered a reception and dinner in New York that evening. Messrs. Stubbs and Firth are on a tour of the country and will visit the important foundries and steel plants in the United States. They will be the guests of the various foundrymen's associations in New England, Philadelphia, Chicago, St. Louis, Detroit, Cleveland and Pittsburgh.

Baltzar de Mare, for the past 30 years connected with the Nicetown, Pa., plant, Midvale Steel & Ordnance Co., has been appointed general manager Union Electric Co., Carnegie, Pa.

Work is being pushed on the plant of the Maryland Steel Rolling Co., Dundalk, Md., and operations are expected to start in about 90 days. At a recent meeting of the stockholders the following directors were re-elected: J. H. Robinette, F. K. Binnix, H. W. Nepier, J. H. Dashields, J. F. Sullivan, K. K. Kirwin and R. S. Baldwin. M. D. Perine, H. F. Leatherwood and R. N. Hanna were elected as new directors. The directors organized by electing H. F. Leatherwood president, J. H. Robinette vice-president, R. N. Hanna treasurer, and J. F. Sullivan secretary. R. S. Baldwin is general manager.

The report of the National Screw Thread Commission has been reviewed by a committee composed of various engineering and technical societies and these members will report to their respective organizations with a recommendation that the Screw Thread Commission report be adopted as prepared. These various societies will then report to the American Engineering Standard committee and when this formality is concluded, the standard for the screw trade will become the standards for all American industries.

Freyn, Brassert & Co., Chicago, have been retained as consulting engineers by the Cranberry Furnace Co., Johnson City, Tenn.

OBITUARY

Death of Knox Taylor

KNOX TAYLOR, president Taylor-Wharton Iron and Steel Co., High Bridge, N. J., died April 4, in his 49th year. His was the fifth generation of his family connected with the industry, which was founded in 1742. Mr. Taylor was born at High Bridge, Oct. 19, 1873, and was graduated from Princeton University with the degree of Bachelor of Science in 1895. In college he was very active in football and other athletics. His love of outdoor life led him to engage in mining engineering in the Rocky Mountains for seven years after leaving college. He returned from the West in 1902 to enter the company's service, started at the bottom and worked up through various departments until he became general manager in October, 1905. The plant had been engaged in the production of manganese steel since 1892, under the license of the Hadfield patents. When he became president in 1910, a policy of expansion was adopted and in 1912 the interests of the William Wharton, Jr. & Co., Inc., of Philadelphia, and its subsidiary, the Philadelphia Roll & Machine Co., were acquired. The Wharton Company had originated the application of manganese steel in track work in co-operation with the old Taylor Iron & Steel Co., and the new combination became known as the Taylor-Wharton Iron & Steel Co. One year later, it was decided to combine the two plants of the Wharton company at Philadelphia and Jenkintown into one new modern plant at Easton, Pa., in close proximity to the main plant at High Bridge, N. J. The Easton plant was in full operation early in 1916. Thus the manufacturing facilities of the Wharton company in 30 years grew from a total shop area under roof of less than 30,000 sq. ft., on less than three acres of ground, to over 430,000 sq. ft. under roof on 50 acres of ground. In 1913 the company also bought the interests of the Tioga Iron & Steel Co., Philadelphia, an acquisition which proved of much importance during the war.

KNOX TAYLOR

When Mr. Taylor unreservedly offered the resources of the company, one of the requests of the Government was that it accept a contract for naval gun forgings, which was an important undertaking in a highly specialized business. The company erected additions to its plant in order to carry out a contract for 8,000,000 pounds, or 1044 complete sets of rough machined 4-inch naval gun forgings. The plant additions were completed, and seven months after the contract was signed, forging had started. Two months later, the first complete set was shipped.

In addition to his important business interests, Mr. Taylor took a very active part in the life of the community and was especially interested in the welfare of the employees and of the boys and girls of the neighborhood. He was responsible for the organization of the first Boy Scout Troop in the fall of 1914, and of Camp Taylor where many boys have spent their vacations. During the war he was keenly interested in the conservation and development of the food supply. Among many organizations of which he was a member were: the Engineers' Club, New York; American Society for Testing Materials, American Institute of Mining and Metallurgical Engineers, American Chemical Society, American Society of Mechanical Engineers, Society for Promotion of Engineering Education, Iron and Steel Institute, England; Princeton Engineering Association and American Iron and Steel Institute.



ROBERT SKEMP, assistant to S. A. Davis, vice-president in charge of operations, the American Sheet & Tin Plate Co., died suddenly in Scottdale, Pa., April 8. He was born 64 years ago in Bilston, South Staffordshire, England, and after learning the sheet steel business in England, came to this country. He became identified in 1887 with W. H. Everson & Co., owners of the Scottdale Iron Works, now the Scottdale works of the American Sheet & Tin Plate Co., working up by successive steps to the presidency of that company, and later when the Scottdale Iron & Steel Co., Ltd., which operated what is now the Old Meadows works, Scottdale, Pa., of the American Sheet & Tin Plate Co., absorbed the Scottdale Iron Works, Mr. Skemp was made general superintendent of both plants. With the absorption of the Scottdale Iron & Steel Co. by the American Sheet Steel Co. he became district manager in charge of the Scottdale and Old Meadows works, Scottdale, the Humbert works, Connellsville, Pa., since abandoned, and the Sabraton works at Morgantown, W. Va. He was appointed in 1910 to the position he held at the time of his death. During the American participation in the World War, he was chief of procurement, gas defense division, chemical warfare, with offices in New York. Mr. Skemp took an active part in civic affairs of Scottdale and for a number of years was a member of the school board, serving as chairman for several terms. Beside his wife, four sons, Robert, Uniontown, Pa.; Arthur and Lee, Scottdale, and Harold, Vandergrift, Pa., survive.



ROBERT SKEMP

H. D. HILDEBRAND, president Hope Engineering & Supply Co., and its affiliated companies, the Hammon Coupler Co. and the Hope Forge & Machine Co., Mt. Vernon, Ohio, died in the Johns Hopkins Hospital, Baltimore, April 8. He was born in Wilmington, Del., 52 years ago and went to Pittsburgh in 1889 to become associated with the Hall Steam Pump Co. and for a number of years had charge of the engineering works of that company. When the Hope Engineering & Supply Co. was organized in 1906, Mr. Hildebrand became its vice-president and in 1915 was elected president. He was a member of the Natural Gas Association of America, the Natural Gas Supply Men's Association and the Engineers' Society of Western Pennsylvania. He was a specialist in gas and air compression and the inventor of many improvements.

WALTER FERGUSON, one of the three partners who constituted H. C. Frick & Co., now the H. C. Frick Coke Co., a subsidiary of the United States Steel Corporation, died at his home in Stamford, Conn., April 8. His brother, Edmund M. Ferguson, and Henry C. Frick, were the other partners. He was one of the organizers of the Brooklyn Edison Co., Brooklyn, and the founder of the Kings County Electric Light Co., which now is part of the Brooklyn Edison Co. He also was active in organization of the Union Carbide Co., of which he was a director, a position he also held with the People's Gas Co., Chicago, the Virginia Iron, Coal & Coke Co., Roanoke, Va., the Virginia & Southwestern Railway and the Detroit & Mackinac Railway. Mr. Ferguson was born in Stamford, Conn., July 6, 1842.

JOHN O. WILLIAMS of the firm of Vought & Williams, New York, iron and steel merchants, died April 9, aged 77 years. He had been ill for some time. Mr. Williams was born in New York in 1845 and as a boy learned the trade of a coppersmith, later becoming a salesman of plumbing supplies. In 1882 he associated himself with I. S. Vought under the firm name of Vought & Williams. He was a member of the Engineers' Club, Arkwright Club and Brooklyn Chamber of Commerce.

Iron and Steel Markets

(Continued from page 1034)

last week paid as high as \$10.50 and \$11 shipping point for selected borings, but only in exceptional cases, the average price paid being nearer \$10. On the other hand, there is practically nothing being done in rolling mill borings and prices remain unchanged. Car lots of cotton ties also were purchased last week at \$5.50 to \$6 shipping point. One New England consumer continues to purchase heavy melting steel at going rates, and a Worcester, Mass., melter has bought horse shoes at \$16 delivered, but the general advance in prices has a tendency to check buying in this territory. Developments in the pig iron market brought out more inquiries for machinery cast than noted before this year, but actual purchases by foundries up to yesterday were light. There also is a better feeling in the market for stove plate. A small tonnage of car wheels is reported sold at \$17.50 delivered to a New England melter.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery	\$17.50 to \$18.00
No. 2 machinery	15.50 to 16.00
Stove plate	14.50 to 15.00
Railroad malleable	13.00 to 13.50
Car wheels	17.00 to 17.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	10.00 to 10.50
No. 1 railroad wrought	11.00 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	6.00 to 6.50
Cast iron borings, rolling mill	6.50 to 7.00
Cast iron borings, chemical	9.50 to 10.00
Blast furnace borings and turnings	6.00 to 6.50
Forged scrap and bundled skeleton	5.50 to 6.00
Street car axles and shafting	12.50 to 13.00
Rerolling rails	10.50 to 11.00

St. Louis

ST. LOUIS, April 11.

Pig Iron.—The activity of the pig iron market continues. Buying was not as heavy as during the preceding week, but several inquiries are pending for heavy tonnage. The market is very firm. Northern iron is still strong at \$20, Chicago, with an advancing tendency, while Southern iron has advanced to \$16 to \$16.50, Birmingham. A Sheffield producer is now selling on the basis of \$16, Birmingham, for water and rail or all rail shipment, against a former price of \$16, Sheffield, tantamount to an advance of 80c. a ton. This maker's price for water and rail shipment to St. Louis is now \$20.24. Heavier buying and smaller stocks give strength to Southern iron. Sales by the Granite City maker include 1500 tons of basic to a local melter and 250 tons of foundry iron to an east side melter. The largest inquiry pending is for 5000 tons of basic from a nearby melter for fourth quarter shipment, while another steel maker in the district is in the market for 2000 tons of basic. A nearby Illinois melter wants 500 tons of foundry iron and there is another inquiry for 350 to 400 tons of foundry iron for shipment to Louisville, Ky. An Indiana concern is in the market for 1000 to 2000 tons of malleable, while a central Illinois melter wants 400 to 600 tons of malleable. A melter in the district wants 500 tons of Southern foundry iron. Orders for Southern iron for water and rail shipment were not so large this week. The demand for ferro alloys is much stronger than it has been for some time. Two orders of 100 tons each were placed for spiegel-eisen and one order of 100 tons of ferromanganese. There also is pending an inquiry for 200 tons of Bessemer ferrosilicon.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.80 freight from Chicago and \$5.74 from Birmingham:

Northern foundry, sil. 1.75 to 2.25	\$22.80
Northern malleable, sil. 1.75 to 2.25	22.80
Basic	22.80
Southern foundry, all rail, sil. 1.75 to 2.25	\$21.74 to 22.20
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	20.24

Finished Iron and Steel.—Railroad business continues the principal item in these lines. The Missouri

Pacific Railroad has an inquiry out for 164,000 angle bars and the same road wants 2000 kegs of track spikes. The Wabash Railway is in the market for 300 36-in. wheels for passenger coaches. Other railroads are in the market for various locomotive part forgings. The market for sheets is strong after an advance of \$3 a ton on blue annealed, black and galvanized, and several of the largest makers are out of the market. Structural steel is moving slowly. New plans are being prepared for the Memphis Auditorium, bids for which were rejected several weeks ago, and new bids will be asked for May 1. The old plans involved about 3000 tons of structural steel and 400 tons of reinforcing bars. Plans now are out for the Federal Reserve Bank building at Oklahoma City. The choice of the general contractor for the Majestic Theater building at Houston, Tex., lies among three concerns there, the job involving about 400 tons of structural steel and 100 tons of reinforcing bars. The demand for wire nails is small, and but little interest is being taken in the advance of 10c.

For stock out of warehouse we quote: Soft steel bars, 2.37 1/2c. per lb.; iron bars, 2.37 1/2c.; structural shapes, 2.47 1/2c.; tank plates, 2.47 1/2c.; No. 10 blue annealed sheets, 3.47 1/2c.; No. 28 black sheets, cold rolled, one pass, 4.15c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, \$3.09 1/4 per 100 lb.; boiler rivets, \$3.19 1/4; tank rivets, 7/16-in. and smaller, 65 and 5 per cent off list; machine bolts, large, 60-10 per cent; small, 60, 10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 65-5 per cent; hot pressed nuts, square or hexagon blank, \$4; and tapped, \$3.75 off list.

Coke.—The coal strike is not having any noticeable effect on the demand for coke at this time. All consumers seem to have made provision for their immediate needs, and are little concerned over the coal situation. There is a better demand, however, for all grades except domestic, which has fallen considerably as a result of the warm weather. The Granite City producer continues to reclaim coke for storage. The better brands of Connellsville coke are bringing \$4.75.

Old Material.—The market for old material continues strong. The last week was marked by continued buying of melting steel by the Scullin Steel Co. and the Commonwealth Steel Co. There is still some speculative trading in the market, and dealers are feeling decidedly more optimistic than they have for some time. Railroad lists for the week include: Great Northern and Terminal Railroad Association, each 1750 tons; Mobile & Ohio, 650 tons, and Kansas City Southern 350 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Old iron rails	\$16.00 to \$16.50
Steel rails, rerolling	14.25 to 14.50
Steel rails, less than 3 ft.	14.25 to 14.50
Relaying rails, standard section	23.00 to 28.00
Cast-iron car wheels	16.00 to 16.50
No. 1 railroad heavy melting steel	12.75 to 13.25
No. 1 heavy shoveling steel	12.25 to 12.75
Frogs, switches and guards, cut apart	14.25 to 14.50

Per Net Ton	
Heavy axle and tire turnings	\$8.50 to \$9.00
Steel angle bars	12.25 to 12.75
Iron car axles	21.50 to 22.00
Steel car axles	15.75 to 16.25
Wrought iron arch bars and transoms	17.50 to 18.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	11.25 to 11.75
Railroad springs	14.00 to 14.50
Steel couplers and knuckles	14.00 to 14.50
Cast iron borings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers cut in sheets and rings	9.00 to 9.50
No. 1 railroad cast	15.50 to 16.00
Stove plate and light cast	13.00 to 13.50
Railroad malleable	12.00 to 12.50
Pipe and flues	8.00 to 8.50
Machine shop turnings	6.50 to 7.00

The New England Iron League held its fourteenth annual dinner and election Friday evening, April 7, at the Boston Athletic Association. R. B. Wallace, Bethlehem Steel Co., Boston, dictator, presided at the dinner and the meeting which followed. H. G. Austin, Lackawanna Steel Co., Boston, was elected dictator for the ensuing year to succeed Mr. Wallace. Mr. Austin on assuming the chair announced that Charles F. Loughead, N. E. Drawn Steel Co., Mansfield, Mass., will serve as secretary.

National Survey of Trade Associations

(Continued from page 1005)

reports are for members only. In the matter of reports on past and closed transaction, eight associations gather the data for the use of their members only and eight gather the data for the public only. Two compile reports without specifying in detail their character or their ultimate goal, and two more are just now studying the whole subject.

The National Association of Manufacturers will discuss trade associations and their activities, based on information from its survey, at its annual meeting in New York on May 10.

Sheet and Tin Plate Manufacturers

The National Association of Sheet and Tin Plate Manufacturers reports that it preserves the standards of quality and weight of sheet and kindred products as manufactured by the members, and to make uniform changes in such fixed standards from time to time as may best meet the demands of the trade. Its aims are: To place this, one of the most important industries in the United States, on such a broad and sound basis that its business as a whole must necessarily be transacted within the limits of the highest standards known to the business world; to cooperate with customers in an effort to eliminate all unsound and unfair practices and methods; to standardize, as far as possible, the method of figuring cost systems in use by the members, and to give to each member the benefit of discoveries or plans leading to a lowering of cost of manufacture and of marketing the product; to discover and assist in transmitting for the benefit of all, new uses for sheets and tin plate, and also the by-products produced in the manufacture thereof; to preserve friendly relations between producers and insure such cooperation as will effect uniformity of goods in weight, quality, sizes and finish; to secure the benefit of a free discussion on cost systems with the view to lowering the cost of production; to bring out into the open, full and free discussion of trade conditions, volume of trade and the needs of the trade; and generally to develop, for the benefit of all concerned, sound commercial conditions throughout the country, in the hope that the possession of accurate information with respect to the conduct of the business and the actual trade conditions will benefit the industry, the trade and the public; for the consideration of matters relating to welfare work; safety first problems; hours of labor; profit sharing and bonus plans; and generally, all questions affecting the industry in its relation to labor, capital and the public. The constitution provides: "It shall be thoroughly understood by members of the association that all information reported to the association or distributed by it, is purely statistical, and pertains only to past and closed transactions; and that no part of the machinery of the association will be permitted to be used to fix prices for the sale of goods, or to divide the territory, or to limit the production of manufacture, or limit or control competition; and no information shall be collected or distributed respecting any prices which any member intends or expects to ask."

Standard Form of Reporting

The association has developed a standard form for the reporting of detailed monthly costs of production. Reports are received, composite report made up, and copy furnished to each contributing member. Identities of the various companies are not divulged. Reports are used for comparison and study.

Statistics are received, compiled, and distributed, covering sales and prices, capacity, production, shipments, stocks on hand, rates of operations, unfilled tonnage, credit information, cost reports, and reports as to hours worked and wages paid. Reports are furnished only in kind and to the extent to which they are contributed by the various members. The association issues questionnaires and composite statements are made up therefrom and furnished to members con-

tributing, on various subjects pertaining to mill practices in manufacture, experiences with different machinery, material and processes, etc.

The association maintains a bureau of labor. This bureau collects information relative to wages, earnings and hours in both the sheet and steel mills; makes comparisons of wages and earnings with wages and earnings on the same jobs in 1914, 1919, 1920, 1921 and 1922; reports tonnage rates in the mills, both union and non-union; compares tonnage rates in independent mills with the same rates in corporation mills; collects information relative to mill practices and policies on every subject; reports wage scales in mills outside the association; compares wages and earnings with other industries at various periods; publishes information as to cost of living, unemployment, industrial accidents, etc.; publishes information relative to labor conditions and labor happenings in other industries; reduces sheet mill nomenclature to a standard (standardizing job names); analyzes and reviews books and reports and plans for industrial betterment; distributes information as to union and non-union wage settlements; issues bulletins on general labor conditions; and generally assists members to secure such information relative to wage rates and working conditions as may enable that member to meet some problem in his own organization.

Pressed Metal Association

The Pressed Metal Association, Cleveland, reports that its object is to establish cordial personal relations between manufacturers of pressed metal products; devise ways and means to promote a feeling of good will between the manufacturers and their customers; devise ways and means to promote better working conditions for the employee; mutual education of one another concerning costs of production; to improve and develop commercial methods in the manufacturing and marketing of pressed metal products; and to obtain and diffuse information on general trade matters. No special work has been done in coding trade terms or phrases, as those in use are generally understood throughout the trade. A standard form of estimate sheet and contract form has been devised which is in general use.

The association is now contemplating a cooperative trade extension program. It has maintained close relations with the Department of Commerce and has volunteered cooperation along any lines that the department deems advisable. It collects and distributes monthly statistics of orders received, shipments, unfilled orders, press operations and employees working. These statistics have been available to the members of the association only. The association declares that it does not engage in any exchange of prices whatsoever.

Tap and Die Institute

The Tap and Die Institute reports that it stimulates acquaintance, confidence and cordial relations among members and throughout the trade; improves the tap and die manufacturing business by striving toward the correction by all proper and legitimate means, of unintelligences, faulty standardization and abuses in the trade; the promotion of publicity in the transaction of business; the development of methods for the removal of false impressions and in their place to disseminate correct information and, by means of a reporting system, to collect from, and distribute among members accurate statistics regarding the entire industry; to devise a scientific system of cost accounting, suitable for the industry, to the end that each manufacturer engaged in the industry may accurately know the cost of his output. In this connection, it is not the purpose of the institute to impose upon any member any cost items or to use, in any manner, the cost system as a means for controlling prices; the encouragement of the true spirit of "co-operative competition" by bringing out into the open, all competitive conditions and introducing the open price policy; to co-operate along the lines of metallurgical research in the securing of better steels for use in manufacturing taps and dies, so that the result would be to raise the stand-

ard of quality to its highest point of efficiency, thereby making a great saving to the consumer; further, to co-operate in the standardization of sizes, dimensions and tolerances of the product manufactured by the institute; to avoid the use of the institute as a price fixing or trade controlling device; to this end, no information will be received, distributed or exchanged relative to actual selling prices previous to the making of an actual and bona fide quotation or bid, or effecting an actual sale, or relative to any customers with whom or territory in which the members intend to do business, and no member shall enter into any agreement, direct or indirect, with any other member that has to do with any prohibited practices, or any other arrangement that will interfere with free, open and active competition among members or with any other person. All information received and distributed shall be absolutely accurate; to co-operate with the Federal Trade Commission to expose and suppress unfair methods of competition; to eliminate secrecy either as to the meetings or operations of the institute. All its proceedings shall be reduced to writing and carefully preserved. The institute has exercised practically no efforts to inaugurate a standard cost accounting system. A monthly bulletin of reports received is issued. Quotations on identical business will be exchanged upon the expiration of 15 days from the date of the last quotation filed or as soon as the secretary receives satisfactory proof that the order has been placed. All information exchanged relates only to past transactions.

National Machine Tool Builders

The National Machine Tool Builders' Association reports that its purpose is to promote the lawful interest of the machine tool industry in the direction of good business ethics; the liberal discussion of subjects pertaining to improvement, standardization, and the methods of manufacturing and marketing machine tools. It collects statistics of production, orders, cancellations and shipments for a few groups of machine tool builders. Nothing is collected as to prices or costs. Different groups exchange price lists as these are issued to the public. Reports are not disseminated to the public, but only to the groups who contribute to the figures making up the reports. In each one of the few reporting groups, there are members who do not contribute figures. Perhaps the most consistent activity of the association has been the attempt to educate the machine tool builder as to the operation of the business cycles, which cause loss of orders to him and unemployment to his men. The study of the business cycles is getting to be better understood among its members as time goes on. The association sends out a monthly review of current factors limiting production, which are the following: labor, material, fuel, transportation, equipment, capital and demand. These different factors and their apparent probable effects on business in general are summarized from various sources and are bulletined to the membership of the association. From a study of shipments of typical machine tools for 20 years, which study was made up by co-operation of some 50 representative builders, the association believes that a complete statistical service of the machine tool industry would clearly anticipate the development of a smash in general business by at least a year. The association believes that if all trade associations and all members of them were to realize the great benefit that such statistical study would confer on the business world; and if the politicians and law-makers would recognize that merely knowing the facts would go very far to eliminate these smashes, which are so detrimental to millions of our population, the law-making and law-enforcing and judicial elements of our Government would have no hesitancy in recognizing that the wide publication of these facts is for the benefit of all industry.

American Drop Forging Institute

The object of the American Drop Forging Institute is to establish cordial personal relations between manufacturers of drop forgings by means of frequent and regular meetings, thereby removing misunderstandings

due to the circulation of false reports and to ignorance of conditions prevailing in different sections of the country; to devise ways and means of promoting a feeling of good will between the manufacturers, their customers, and the public; to devise ways and means for keeping all works in regular operation, thereby giving labor steady employment, and to promote better relations between employer and employee and better working conditions for the employee; to standardize, so far as practicable, the drop forging industry; to devise and encourage the adoption and use of better and more uniform methods of cost accounting, and standardization of contract forms; to standardize designs and specifications; and to develop and improve efficient practice in the manufacture and marketing of drop forged products; to collect and disseminate significant information relating to the manufacture and sale of drop forged products, such as capacity and output of various plants, percentage of equipment operating over a given period, percentage of normal total employees engaged, rates of wages paid to various classes of labor, total volume of business booked and shipments made over given periods, and any other information which will serve as a barometer showing the general trend of conditions throughout the industry. The cost accounting committee is very active, and uniform cost reports are prepared.

The institute has maintained close relations with the Department of Commerce and has volunteered co-operation along any lines that the department deems advisable. It collects monthly reports on orders, shipments, unfilled orders, hammer operations, percentage of normal employees, etc. The reports have been available to reporting members only.

American Foundrymen's Association

The object of the American Foundrymen's Association is to promote the arts and sciences practiced or applied by foundry operators or others concerned in the production of castings; and to this end, to hold and conduct meetings of its members for the consideration and discussion of subjects pertaining or related to the business of foundry operators; to hold exhibits, displays and demonstrations of useful machinery, equipment and methods; to print, publish and distribute papers, discussions and other information pertaining to the business of foundrymen; and by other lawful means to promote the technical interests of the foundry industry and the welfare of all persons therein or connected therewith. The association has had prepared a uniform cost accounting system, which has been published and recommended to the members. From time to time it has adopted as standard practice, specifications and methods pertaining to certain phases of foundry work. Most of these standards adopted are physical specifications for steel, gray iron and malleable castings. Committees are working in conjunction with similar committees of the American Society for Testing Materials.

Steel Barrel Manufacturers

The Steel Barrel Manufacturers' Association strives to promote friendly relations between the manufacturers of steel barrels and drums and similar metal containers; to collect and distribute to the members, so far as may be lawful, information useful to them in the business of manufacturing and marketing steel barrels and drums and similar metal containers. It has developed, with the aid of outside accountants, a standard cost system, which is in use in the plants of about 75 per cent of its members. Through the Specifications and Standards Committee of the association, it has adopted minimum weights for barrels of various types and sizes and standard threads for bung openings, but has never done anything in the way of standard forms of contracts, machinery or processes. The association collects and distributes to its members only the following statistics: Orders received with prices and distribution by states; costs; collection and distribution to the members and the public, through the Department of Commerce, of information as to production, consumption, distribution and unfilled orders on hand.

MORE EMPLOYMENT

Number of Idle Men in Many Industries Slowly Decreasing

WASHINGTON, April 11.—With an increase of 17,930 workmen the greatest gain in employment in March was made by the iron and steel industry, the total increase over February being 39,558, or 2.5 per cent, according to the United States Employment Service. The percentage of increase in the iron and steel industry was 5.3, giving it the greatest percentage of 22.3 of the total of all employees of the 10 industries which registered increases. In metal and metal products other than iron and steel, there was an increase of 4084 workmen, a gain of 4.9 per cent, while in railroad repair shops the increase was 933 employees, or 1.5 per cent. Other industries showing increases in employment were miscellaneous, stone, clay and glass; lumber and its manufacturer; tobacco and its manufacturers; liquor and beverages, and paper and printing. The industries showing a decrease were leather and its finished products; textiles and their products; chemicals and allied products, and food and kindred products. The total increase of 50,204 workmen in the 10 industries was offset by a total decrease of 10,646 in four industries.

The number of additional workmen employed in iron and steel towns in March and the percentage of increase over February are shown as follows: Johnstown, Pa., 1257 or 11.8 per cent; Youngstown, 2913 or 10.5 per cent; Toledo, 1606 or 10 per cent; Pittsburgh, 4916 or 6.8 per cent; Chicago, 9205 or 5.6 per cent; Buffalo, 933 or 3.5 per cent; Birmingham, Ala., 786 or 3.3 per cent; Cleveland, 1,553 or 2.1 per cent; New York, 2732 or 1.8 per cent; Philadelphia, 931 or .95 per cent, and Cincinnati, 48 or .36 per cent.

Commenting upon the labor situation, Francis I. Jones, Director General of Employment Service, says in part: "Industry took up considerable slack in March, showing an improvement of 2.5 per cent over February and 7 per cent over July, 1921, which was the low water mark in employment. . . .

"Business will not come back with a jump, but every indication points to a general progressive upward movement. The coal situation may check improvement in certain lines of industry, interrupting a steady healthy swing heading to normal condition. However, there is a general pronounced optimistic feeling that warrants the statement that April will show increased activity, other than in coal and cotton textiles. Reports from 231 of the principal industrial centers indicate an active building program of which the encouraging feature is the increased number of residential constructions. Agriculture is rapidly coming back, and there is an increased demand for experienced help."

Coal Strike Affects Refractories Market

PITTSBURGH, April 10.—Demands upon refractories manufacturers from the makers of iron and steel are constant rather than large, there still being a lack of anticipatory buying. March was a very good month in fire clay and silica brick from the standpoint of orders and shipments, this being in keeping with conditions in the iron and steel industry, but this month does not promise as well. The possibility that the strike of the union coal miners, which has rather seriously affected the non-union fields, may force a curtailment of blast furnace and steel works activities, already is being felt. Steel plant reserve stocks of coal were understood to be sufficient for 60 to 90 days, but now that there is danger that the supply of coal from non-union fields may be curtailed, operating schedules cannot be definitely made beyond existing coal stocks. There is also the danger that consumers of iron and steel will be affected by the coal strike and this might force a slowing-down of the steel plant operations.

No special change is noted in refractories prices. A couple of small Pennsylvania makers of fire clay brick still are going as low as \$30 per 1000 to secure

orders for heavy duty brick, and Pennsylvania silica brick can still be bought as low as \$28. Manufacturers controlling the bulk of production, however, are holding to the quotations printed below. Most makers are amply fortified with regard to fuel supplies.

We quote per 1000 f.o.b. works:		
	High Duty	Moderate Duty
Pennsylvania	\$32.00 to \$35.00	\$30.00 to \$32.00
Ohio	30.00 to 35.00	28.00 to 30.00
Kentucky	32.00 to 35.00	30.00 to 32.00
Illinois	32.00 to 35.00	30.00 to 32.00
Missouri	32.00 to 35.00	28.00 to 32.00
Silica Brick		
Pennsylvania		30.00
Chicago	35.00 to 37.00	40.00
Birmingham		
Magnesite Brick		
Standard size per net ton (f.o.b. Baltimore)		53.00
Grain magnesite per net ton (f.o.b. Baltimore)		28.00
Chrome Brick		
Standard size, per net ton		40.00 to 42.00

How Large Smelting Company Reduced Labor Costs

In a report on increased operating efficiency in plants of the American Smelting & Refining Co., President Simon Guggenheim submits the following information to stockholders concerning problems faced, policies pursued and results obtained:

Illustrative of the policy pursued with respect to meeting the hard conditions imposed by the war's aftermath, the methods applied at one of our larger plants may serve as typical of the general efficiency policies throughout the organization.

A "job analysis" was made covering every operation in the plant so that the company might discover and take up any slack existing. Classes were formed in executive and administrative work, in foremen's general training, and in vocational training.

Out of this industrial training has grown a better and closer supervision by plant executives, so that the working force on each operation has been reduced to a minimum never before reached and a much greater production has been obtained per man employed.

A few figures taken at random from operating records of the various plants during 1921 compared to operations during 1914 will serve to illustrate the above statement:

Plants	Operation	Tons per Man per 8-hr. Day	
		Average, 1914	Average, October, 1921
Durango	Crushing	31.8	52.2
Murray	Unloading	9.2	25.3
Arkansas Valley	Roasting	6.4	13.6
El Paso	Bricking	2.0	4.4

Indicating the effect of efficiency and other managerial policies on labor costs: In 1914, repair, supply and construction labor was paid an average of \$2.42 for an 8-hr. day, while in November, 1920, the rate was \$5.39, an increase of 123 per cent. In December, 1921, through various readjustments, the rates for repair, supply and construction labor had been reduced to \$4 for an 8-hr. day. This was a decrease of 25.9 per cent below the highest rate, \$5.39, paid in November, 1920.

The installation of mechanical equipment, where it was certain that it would reduce labor hours per ton, has been a factor in the reduction of costs, and changes in fuel uses have also contributed largely in savings in material, time and costs.

Every plant activity, from the ore to the finished product, has undergone the closest scrutiny, and wherever an economy has been possible, or a better method feasible, the company has effected the economy and adopted the better method. The result has been that we are on a sound basis and able in every way to take advantage of the turn of the tide which, it appears to me, is now on its way.

Automobile Distribution in the United States

An interesting map published by *Hardware Age* shows the 1921 automobile registration in each of the 48 States, and compares the figure with the 1920 population. It may be noted that 19 of the 22 States west of the Mississippi have more than 100 cars for each 1000 population, New Mexico, Arkansas and Louisiana being the only ones under that figure. Conversely, only eight of the 26 States east of the Mississippi have more than 100 cars to each 1000 population, these being Wisconsin, Michigan, Illinois, Indiana, Ohio, Florida, Vermont and Maine.

NEW TRADE PUBLICATIONS

Diamond Fiber.—Diamond State Fiber Co., Bridgeport, Pa. A 92-page booklet descriptive of the manufacture and use of vulcanized fiber. This shows it as an insulating material, as a receptacle, such as cans, baskets, trays and boxes, and ties it up with many uses in the automotive industry, electrical machinery, textile machinery and in railroad equipment and many things of mechanical and industrial use. Gears of various sorts, bushings, combs, chair seats, etc., illustrate the diversity of use.

Lopulco Pulverized Fuel System.—Combustion Engineering Corporation, Broad Street, New York. A booklet of 30 pages, with inserted charts, describing the use of this system to the fueling of locomotives. Results of tests on a Santa Fé freight locomotive are given in some detail, with briefer records of tests on other lines.

Ozone Pure-Airifier.—Ozone Pure Airifier Co., 1401 West Jackson Boulevard, Chicago. An 8-page pamphlet describing the use of ozone in ventilation and its application in schools and other places, including the United States Capitol at Washington.

Condesite Celoron.—Diamond State Fiber Co., Bridgeport, Pa. A 36-page booklet descriptive of material possessing many qualities of hard fiber and at the same time thoroughly waterproof. This may be obtained in rods, sheets and tubes, and is made into many articles, including gears, bushings, valve disks, insulators, etc.

Trane Thermetal Vents.—Trane Co., La Crosse, Wis. A 4-page leaflet illustrating a quick vent valve and a float vent valve. In both cases the valve is operated by a thermostatic element.

Cement Guns.—Cement Gun Construction Co., Chicago and Pittsburgh. A 32-page book of views, showing recent cases where Gunite has been used on concrete work. Among the various purposes for which this has been used may be mentioned the incasing of steel bridges, the fire-proofing of steel structures, making fire stops in steel roof trusses, building water reservoirs, reconstructing defective masonry and disintegrated concrete, etc.

Type K Stoker.—Combustion Engineering Corporation, Broad Street, New York. A 4-page leaflet dealing with a stoker for operating boilers ranging up to 200 hp. This form of underfeed stoker is operated by steam and is designed for use in small plants.

Goulds Water Supply Pump.—Goulds Mfg. Co., Seneca Falls, N. Y. A 2-page leaflet describing a small pump for direct connection to gasoline engine of $1\frac{1}{2}$ to 2 hp. The pump has a capacity of 360 gal per hr., and is recommended for domestic water supply, particularly on country estates.

Humidifiers.—Thomas J. Douglass & Co., 441 North Dearborn Street, Chicago, has issued a booklet on various types of humidifiers for use in connection with heating and ventilating systems.

Saws and Tools.—Hunter Saw & Machine Co., Pittsburgh, has issued an 88-page catalog descriptive of Hunter saws and tools. Milling saws, slitting saws, circular saws, and various other types for cutting metal, are illustrated and described. The catalog also contains data concerning various other products of the company, such as saw-sharpening machines, chisel blanks, rivet sets, etc. List prices are furnished.

Industrial Buildings.—Mills, Rhines, Bellman & Nordhoff, construction engineers, Toledo, Ohio, have issued an illustrated booklet on industrial buildings, showing solutions of some of the problems encountered in constructing buildings for various kinds of manufacturing purposes. Machine shops, foundries, warehouses and general manufacturing structures are illustrated, floor plans being given in several instances.

Foundry Equipment.—Cummings Machine Co., Minter, Ohio. Catalog No. 65, 32 pages, describes and illustrates a line of foundry equipment, including welded and riveted steel bowls, bull ladle and crucible shanks, crucible tongs, bull ladles, crane, buggy and reservoir ladles, brass melting furnaces, etc.

Crawling Tractor Cranes.—Industrial Works, Bay City, Mich. Catalog No. 113 illustrates and describes the type BC Industrial crawling tractor crane of 20,000 lb. capacity. This crane is adapted for road contractors, lumber and coal dealers, railroad reclamation and storage yards and moderate-size manufacturing plants.

Power Plant Piping.—M. W. Kellogg Co., 90 West Street, New York. Illustrated catalog of 130 pages, outlining full scope of Kellogg service in power plant pip-

ing. Illustrations of typical installations. Complete specifications for various kinds of material used in such work and addenda of statistical information, such as table of properties of saturated steam, flow of steam in pipes, table of equation of pipes, etc.

Condensing Equipment.—Wheeler Condenser & Engineering Co., Carteret, N. J. General catalog, entitled "Wheeler Condensers," illustrates and describes condensers and accessories for stationary and marine service. Many of the designs described are of interest to power plant engineers. A condenser data sheet is included with each catalog.

Development of By-Product Coke Oven.—Semet-Solvay Co., Syracuse, N. Y. A 16-page illustrated booklet giving a brief history of the Semet-Solvay by-product coke oven and its development.

Self-Opening Die Heads.—Eastern Machine Screw Corporation, New Haven, Conn. A 96-page catalog, illustrated, which goes beyond the confines of the usual catalog in giving considerable valuable data to the man working out threading problems. H. & G. die heads are pictured and described. Some of the useful information contained in the catalog follows: Data pertaining to thread cutting, measuring pitch diameter, U. S. standard thread, S. A. E. standard thread, A. S. M. E. standard screw thread, Sharp V standard thread, Whitworth standard thread, Briggs' standard pipe thread, Whitworth standard pipe thread, gas fixture threads (brass pipe), Acme standard thread, French and International standard threads, depth of screw threads, decimal inch equivalents of millimeters, cutting speeds, weight per foot of screw stock.

High Pressure Valves and Fittings.—Hydraulic Press Mfg. Co., Mount Gilead, Ohio. Catalog 43-B contains 64 pages of illustrations and descriptions of high pressure valves and fittings, tables and other helpful information.

Mesta Una-Flow Engines.—Mesta Machine Co., Pittsburgh. Bulletin U covers Mesta una-flow engines built under the Stumpf patents. The bulletin refers to such engines for use in connection with rolling mills, blast furnaces, and for driving generators. The company also builds this type of engine for driving sugar mills, textile mills, cement plants, etc.

Material Handling Equipment.—Vulcan Iron Works, Jersey City, N. J. This is the first catalog issued by the Vulcan works covering its complete line of material handling equipment, although it has been manufacturing products of this kind for some years. The products illustrated and described in the 24-page booklet include buckets of various types and dredging equipment.

Air Compressors and Vacuum Pumps.—Pennsylvania Pump & Compressor Co., Easton, Pa. A 16-page pamphlet, No. 102, illustrated, covering the company's single-stage, straight-line air compressors and vacuum pumps in both belt and steam-driven types. Describes in detail the Pennsylvania construction. Features of the equipment are enumerated as follows: Both inlet and discharge valve assembly interchangeable; removable phosphor bronze main bearings; aluminum oil guard; full splash lubrication; float oil gage; solid end connecting rod, etc.

Sand Mixers.—National Engineering Co., 549 West Washington Boulevard, Chicago. Bulletin No. 76, describing all four sizes of its Simpson sand mixer, including the newest and largest size, No. 3, with 8 ft. diameter pan. Other sizes are the No. 0, 3 ft. diameter; No. 1, 4 ft. diameter; No. 2, 6 ft. diameter. Simpson mixers are designed for use in any foundry for mixing facing sand, core sand and other foundry sand mixtures, as well as for the preparation of daubing for lining cupolas, ladles, ovens, etc.

Technologic paper of the Bureau of Standards, No. 207, entitled, "Manufacture and Properties of Steel Plates Containing Zirconium and Other Elements," is just off the press. The mechanical properties and microstructure of 193 experimental heats of steel containing as principal variable elements C, Si, Ni, Al, Ti, Zr, Ce, B, Cu, Co, U, Mo, Cr, and W have been studied. Extremely high tensile properties with excellent ductility and toughness can be obtained from a nickel-silicon steel without the addition of expensive alloying elements. A method is described for the chemical analysis of steels containing zirconium.

"The Principles Underlying Radio Communication" is the title of an elementary book on radio communication issued by the Government Printing Office at Washington, for sale at \$1 per copy. It appears that this is a revised edition of a pamphlet issued originally for the enlisted men of the Signal Corps. The revised edition contains some 600 pages and 300 illustrations.

TRADE CHANGES

The Connecticut Marine Boiler Works Co., Bridgeport, Conn., has recently added two additional departments to its present boiler business. The new divisions include manufacturing a combination door and lock, and also the manufacture of tin and galvanized iron appliances.

The Electric Furnace Co. has moved its general and sales offices from Alliance, Ohio, to Salem, Ohio. By this action all departments of the company will be consolidated at its works, Wilson Street and Pennsylvania Railroad, Salem, Ohio.

General offices U. S. Chain & Forging Co. have been moved from the second to the fifth floor, Union Arcade Building, Pittsburgh. In its new quarters the company will have a connected suite of rooms numbered 564 to 575, inclusive.

The Trans-Continental Engineering Co., Inc., inspection, testing and consultation, formerly located on the fourth floor of the Transportation Building, Chicago, has moved its general offices to larger quarters on the second floor of the same building.

Sandvik Steel, Inc., has consolidated its general steel and steel belt conveyor departments with executive offices in the Woolworth Building, 233 Broadway, New York. W. D. Thomas, formerly manager of the New York export sales, American Rolling Mill Co., is president and general manager. Anders Johnson, formerly staff engineer of the conveyor department of the Sandvikens Jernverks Aktiebolag, Sandviken, Sweden, is vice president. Garrick M. Spencer is secretary and Harry Carlson, formerly vice president and general manager of the American Galco, Inc., New York, is sales manager.

M. A. Hanna & Co., Cleveland, announce the removal of their Detroit offices to 1430 First National Bank Bldg.

The National Association of Farm Equipment Manufacturers, formerly the National Implement and Vehicle Association, removed its headquarters from the Commonwealth Edison Co. building to 413-21 Transportation building, Chicago, effective April 1. The Association will hold its twenty-ninth annual convention at the Congress Hotel, Chicago, October 18 to 20 inclusive.

The Detroit Seamless Steel Tubes Co., Detroit, maker of cold drawn seamless boiler and mechanical tubing, has established its own branch sales office in New York, in the Canadian Pacific Building, 342 Madison Avenue. H. C. Kensing has been appointed district sales manager for the New York territory. He is a seamless steel tube expert, having previously been manager of the steel tubing department of the U. T. Hungerford Brass & Copper Co., in its New York branch.

The Universal Tool Co., a corporation of New Jersey, has purchased the business conducted at Garwood, N. J., by the Universal Tool Co., Inc., a corporation of Michigan, which has been in the hands of a Federal receiver for the past few months. The sale included all of the assets of the Universal Tool Co., Inc., a corporation of Michigan, except its accounts receivable. In addition to manufacturing the Universal cylinder reborning tool and the Ford and Fordson main bearing replacement equipment, the company expects in the very near future to make other equipment which will prove as profitable to the jobber as to other well established lines. The officers of the company are Robert E. Roseberry, president; H. R. McGraw, vice-president; Donald McGraw, treasurer, and G. J. Miller, secretary.

The Cleveland office of William K. Stamets, Pittsburgh machine-tool dealer, has been moved to 974 and 976 Kirby Building. The Stamets organization recently concluded agency arrangements with a group of Hartford manufacturers including Billings & Spencer Co., Hanson-Whitney Machine Co., Hartford Tap & Gauge Co., Taylor & Fenn Co. and the Whitney Mfg. Co. George D. Miller is manager of the Cleveland office.

The Cleveland office of the Black & Decker Mfg. Co., which was located at 6225 Carnegie Avenue, has been removed to 2030 East Twenty-second Street. It is in charge of Dan Paul, formerly manager of the Black & Decker Pittsburgh office.

The Chain Belt Co., Milwaukee, has announced the appointment of G. F. Sherratt as manager of the Pittsburgh office in the Union Arcade Building. Mr. Sherratt will be in charge of all the company's chain and engineering business in the Pittsburgh territory and is equipped to render engineering service on power transmitting and material handling problems. The Ward Equipment Co., Pittsburgh, will con-

tinue to handle the complete line of Rex concrete mixers and pavers, and the United Equipment Co. the Rex traveling water screens.

The Combustion Engineering Corporation, New York, has opened a new branch office at 1137 Guardian Building, Cleveland, in charge of Frank Henderson, who has been associated with several of the most prominent stoker companies in that territory for many years.

Theodore Geissmann & Co., sales representatives of various iron and steel mills, McCormick Building, Chicago, have opened an office at Minneapolis, Minn., in charge of E. C. Hvale.

G. Albert Kenyon, of the Barris-Kenyon Co., Pittsfield, Mass., has disposed of his interest to Philip W. Goewey, formerly treasurer of the Telelectric Co. and of the Pittsfield Machine & Tool Co. Mr. Goewey assumed the duties of treasurer March 31.

Crocker Brothers have recently changed their Boston office address from No. 24 Milk Street to No. 53 State Street, Room No. 508.

Plans of New Companies

The All Steel Lunch Wagon Co., 45 Nassau Street, New York, owes its organization to the fact that lunch wagons, in operation throughout the East, are built of wood and do not comply with building codes as applying to buildings erected within the fire limits of some cities. Some cities have placed restrictions on wooden wagons and the new company will build all-steel constructed wagons. Approximately seventy-five per cent of the work is done by contract and the assembling is done by the All Steel Lunch Wagon Co., which will place orders for the frame, which is fabricated, the enclosure of the wagon and other parts.

The Normal Glass Co., 6941 South Halstead Street, Chicago, has let contracts for a one-story factory, 50 x 117 ft., at 7530-2 South Halstead Street, to cost \$9,000.

The Safety Mine Car Brake Co., Indiana, Pa., does not expect to manufacture its double acting brake and non-riding brake shoe for mine cars, but will have its work done by contract. It is negotiating with the Safety Mine Appliances Co., Pittsburgh, which is desirous of manufacturing and selling the brake.

The A. O. Davis Machine & Mfg. Co., Virden, Ill., incorporated with a capital of \$100,000 to manufacture tractors, engines, etc., is having its work done by contract and the contracts have already been let. It expects to build its own factory at a later date and will then be in the market for equipment, although no definite time has been set.

The Cooper Co., Ellwood, Ind., incorporated with a capital of \$50,000, is a successor of the Ellwood Foundry, manufacturer of gray iron castings. The company expects to do jobbing work. It is fully equipped and is now looking for a good foundry man. The officers of the company are: Clayton C. Cooper, president, W. T. McNamara, vice-president, and A. Levi, secretary and treasurer.

The New York Bolt & Specialties Co., Inc., is a corporation organized under the laws of New York in the sum of \$43,000 for the purpose of manufacturing and dealing in bolts, nuts, rods, washers, forgings, screw machine products and heavy hardware specialties for general contractors, shipyards, boiler and machine shops, steam fitters, plumbers and electrical contractors and public service corporations. E. W. Farmer, general manager for 18 years in a similar line for the Builders' Iron & Steel Co., Boston, is president and general manager of the new concern and Clarence M. Stowe, formerly engineer associated with the Hamilton & Chambers Co., steel engineer and contractor of New York, is treasurer. The corporation has leased a portion of the land and buildings occupied by the Hamilton & Chambers Co. at 232 Kent Street, Greenpoint, Brooklyn, and has secured machinery and equipment. It is also installing in addition some special machinery in the bolt, screw and forging line to cover a range from $\frac{1}{4}$ in. to 3 in., inclusive, together with heating furnaces, bending and punching machines for light and heavy press work. The company does not intend to go into quantity production, but confines its operations to local business wanted for quick delivery of a special nature. It is intended that with its large range and variety of machinery that it will be one of the largest and best equipped jobbing shops of its kind in New York and vicinity.

The Aluminum Die-Casting Corporation, 87 35th Street, Brooklyn, expects to start manufacturing die castings in Garwood, N. J., about May 1, having purchased the old C. & C. plant in Garwood which is being remodeled. The company is purchasing very little new equipment, as it expects to take over the business formerly conducted by the Acme Die Casting Corporation, Brooklyn.

Machinery Markets and News of the Works

APRIL BRINGS IMPROVEMENT

Steady But Slow Betterment in Machine-Tool Trade Now in Evidence

Automotive Industry, Railroads and Makers of Radio Apparatus Interested in Tools

The slight improvement in machine-tool business, which became apparent late in March, is being maintained this month. The betterment, though slow, appears to be steady and machine-tool sellers are now more confident that the marked increase in operations in some other industries will bring more machine-tool business within the next few months.

Indications at Cleveland and Detroit point to some buying by automobile manufacturers. A Detroit company is inquiring for 12 to 15 automatic screw machines, while another Detroit automobile company has bought two turret lathes, making four in all it has bought within the past few weeks. Orders for other tools have also been placed. An Eastern manufacturer of automobile parts is operating at 100 per cent and will shortly issue a large list of tools it will buy.

Railroads are buying repair parts to keep present shop equipment in running order, and, with the excep-

tion of a few roads, are not interested in new tools, except here and there an individual machine. The Santa Fe, however, has issued a new list of 24 items for machine shop, foundry and woodworking shop, and it is expected that this road will soon buy some of the tools for which it has been inquiring in recent months. The New York Central and Illinois Central are also expected to buy on a large scale soon. The Chicago, Burlington & Quincy has taken bids on a new shop at Denver, and inquiries for shop equipment will probably be issued soon.

Among the industries which are active buyers at present, the radio industry stands out. New factories for manufacturing radio apparatus have been springing up over night and there has been a good demand for small tools from these companies.

Cincinnati manufacturers comment on the improved demand from the South. A New Orleans dealer has sent out an inquiry for eight lathes for prompt shipment.

The Palmer Steel Co., Holyoke, Mass., has bought several fabricating tools for a new structural steel shop. The Dillon Brothers Machine Co., Wheeling, W. Va., is a prospective purchaser of forging hammers and other tools. The General Electric Co., Schenectady, is inquiring for a few small tools, lathes and a drill.

New York

NEW YORK, April 11.

The past week has brought out more inquiry for machine tools than has been in evidence in several weeks. Orders are still difficult to obtain. Demand for used tools shows more life than that for new tools. The McCabe & Shearan Machinery Corporation, 149 Broadway, has sold three used 48-in. lathes to plants in Arkansas, Missouri and Ohio; also a used 6-ft. radial drill to a company at Harrisburg, Pa.

The general Electric Co., Schenectady, N. Y., has issued inquiries for three lathes, a drill and other small machines.

A slight slackening in activity on cranes has been evident in the past week or ten days. Locomotive crane sales are extremely difficult to make in and around this district, as buying is largely a question of price and there are numerous used cranes being offered. Conditions for selling new locomotive and crawl-tread cranes in the Middle West are said to be much better. The inquiry from Jenks & Ballou, Providence, R. I., for four cranes for the Narragansett Electric Light & Power Co., Providence, calls for two 10-ton, one 1½-ton and one 1-ton overhead traveling cranes. A recent export inquiry for Japan, issued by Okura & Co. and Mitsui & Co., New York, is for a 30-ton hammer-head crane, 45-ft. radius and 5-ton auxiliary hoist. The Davies & Thomas Co., Catawissa, Pa., has not yet closed for the 7½-ton crane for which inquiry was recently issued.

Among recent sales were: Cleveland Crane & Engineering Co., a 110-ton, 52-ft. span power house crane to the West Penn Power Co., Pittsburgh; Pawling & Harnischfeger Co., 25-ton, 1-motor, power house crane to the Foundation Co. and a 5-ton, 50-ft. span overhead crane to the Flockhart Foundry Co., Newark, N. J. It is reported that the 5-ton crane inquired for by the Habirshaw Electric Cable Co., Yonkers, N. Y., was placed with the Shepard Electric Crane & Hoist Co.

The Lamson Co., Boston, will soon have completed its new plant at Syracuse, N. Y., into which it will move all of its equipment from its New England plant. The Syracuse buildings include a structural steel shop, a general manufacturing building and office structure. The Lamson Co.

recently bought several punches and shears for its structural steel shop.

The Ford Instrument Co., 80 Lafayette Street, New York, manufacturer of special tools and instruments, has leased the three-story plant to be erected on Nelson Avenue, Long Island City, by the Underpinning & Foundation Co., 290 Broadway, New York, for which the building contract has just been let to the American Concrete Steel Co., 27 Clinton Street, Newark, N. J.

The Department of Health, city of New York, 505 Pearl Street, will soon call for bids for a one-story power house, 47 x 105 ft., at East Fifteenth Street and the East River. William E. Austin, 46 West Thirty-fourth Street, is architect.

A vocational department will be installed in the new high school to be erected at Freeport, N. Y., estimated to cost about \$600,000.

The Prudential Iron Works, 633 Concord Avenue, New York, has taken title to five city lots on 140th Street and the New York, New Haven & Hartford Railroad, and has plans in preparation for an addition.

The Federal Radio Laboratories, Inc., 403 West First Street, Elmira, N. Y., will install a machine shop at its plant for the manufacture of metal radio equipment and parts. C. E. Johnson is head.

Motors, electrical and mechanical power equipment, and other machinery will be installed in the one-story plant, 152 x 350 ft., to be erected by the Conley Tin Foil Co., 521 West Twenty-fifth Street, New York, on Woodhaven Avenue, Long Island City, contract for which has just been let to the Foundation Co., 120 Broadway. It will cost about \$175,000, including machinery. Edwin J. Conley is president.

Bids will be received until April 21, by the New York Central Railroad, New York, for motors and controls, metal floors for bridges, and a quantity of switch tongues and tie dating nails. C. S. White, 466 Lexington Avenue, is purchasing agent.

The Greene Machine Co., Watertown, N. Y., is planning for the erection of a one-story machine shop. C. H. Greene is head.

A vocational department will be installed in the three-story high school to be erected at Riverhead, L. I., estimated to cost \$250,000. Tooker & Marsh, 101 Park Avenue, New York, are architects.

The Interborough Rapid Transit Co., 165 Broadway, New York, is planning for the erection of new car repair shops in connection with storage yards to provide for new rolling stock. Frank Hedley is president and general manager.

The Department of Street Cleaning, Municipal Building, New York, will install new shop equipment at its automobile repair works.

A vocational department will be installed in the new high school to be erected at Cornwall-on-Hudson, N. Y., plans for which are being prepared by Tooker & Marsh, 101 Park Avenue, New York, architects.

The State Hospital Commission, Albany, N. Y., is taking bids until April 19, for refrigerating machinery and other equipment for installation at the State Hospital, Central Islip, N. Y. L. F. Pilcher is State architect.

The Granby Consolidated Mining, Smelting & Power Co., 25 Broad Street, New York, is planning for the erection of a hydroelectric generating plant and dam at its properties, estimated to cost in excess of \$400,000. It has arranged for a stock issue of \$750,000, a portion of the fund to be used for the power development.

The Hudson Pattern Works, 444 West Thirteenth Street, New York, manufacturer of metal and wood patterns, has leased a floor in the building at 848 Washington Street for new works.

The Brennan Engineering Co., Mill Street, Watertown, N. Y., will install a pipe tapping and threading machine and other equipment at its plant.

The State Engineering Department, Albany, N. Y., will prepare plans for hydroelectric power plants at the Crescent Dam and Visscher's Ferry, totaling in excess of 10,000-hp. capacity. The power will be used for the operation of locks, bridges, etc., on the barge canal, and other State service.

The Common Council, Barnegat, N. J., is having plans prepared for the installation of a municipal electric lighting plant.

The Commanding Officer, Raritan Arsenal, Metuchen, N. J., will receive bids until April 18 for 3 pipe cutters, 4 ratchet drills, 288 files, 288 hacksaw blades, 24 cutting pliers, 40 cold chisels, 3 eccentric clamps, 4 speed indicators and 4 steel scales, all as set forth in circular 233; also, until April 17, for 12 sets of copper jaws for vises, 24 electrician's pliers, 12 screw drivers and 12 tinner's snips, as set forth in circular 228; and until April 19, for 100 ft. of brass rod, 160 sq. ft. of medium sheet brass and 95 ft. of tobim bronze, as set forth in circular 230.

The Edward Hollander Tool Co., Newark, recently organized, will operate a plant at 142 Miller Street, for the manufacture of adjustable broaches and kindred specialties.

A vocational department will be installed in the high school to be erected at Verona, N. J., bids for which will be asked at an early date. It will cost \$150,000. Guilbert & Betelle, 546 Broad Street, Newark, are architects.

A vocational department will be installed in the high school to be erected at Irvington, N. J., to cost \$775,000, in accordance with estimates and preliminary sketches prepared by R. L. Saunders, superintendent.

The Jewett Mfg. Co., 32 Austin Street, Newark, manufacturer of wireless and electrical equipment, has leased the three-story building at 226-28 Sherman Avenue, totaling 15,000 sq. ft. of floor space, for a new plant.

Philadelphia

PHILADELPHIA, April 10.

The United Gas Improvement Co., Broad and Arch streets, Philadelphia, operating electric utilities in different parts of the State, will build a new electric power plant at Norristown, Pa.

The International Harvester Co., 216 North Twenty-third Street, Philadelphia, will build a five-story distributing plant, 100 x 130 ft., with one-story machine works and service building for farm tractors, motor trucks, etc., 100 x 140 ft., at Sixteenth Street and Indiana Avenue, to cost \$500,000, including equipment. Bids are being taken. W. D. Price, 5408 North Central Avenue, Chicago, is engineer.

The S. S. White Dental Mfg. Co., 211 South Twelfth Street, Philadelphia, manufacturer of dental instruments, etc., has taken title to the factory at Unity and Oakland streets, heretofore owned by the Griffon Co. It will be used as a new plant.

The city purchasing agent, room 312, City Hall, Philadelphia, will take bids until April 20 for a quantity of copper wire. Horace V. MacFadyom is acting purchasing agent.

Cranes and other freight handling and conveying machinery will be installed on the new municipal pier to be constructed at the foot of Porter Street, Philadelphia, by the Department of Wharves, Docks and Ferries, Bourse Building, estimated to cost \$3,500,000, complete. Contract for the superstructure has been let to the Franklin M. Harris Co., Penn Street, at \$1,250,000.

The Berger Brothers Co., 229 Arch Street, Philadelphia, manufacturer of tinner's and roofers' tools, supplies, etc., will erect a new building on site adjoining its works.

The Philadelphia Electric Co., Tenth and Chestnut streets, Philadelphia, has arranged for an increase in indebtedness from \$60,000,000 to \$150,000,000, a portion of the proceeds to be used for the construction of additions to local electric power plants, line extensions, etc. A. V. R. Coe is secretary.

The N. E. Ice Mfg. Co., Luroy and Front streets, Philadelphia, will commence the immediate erection of a new plant, comprising two one-story buildings, 70 x 115 ft., and 43 x 105 ft.

Martin H. Walrath, Park and Glenwood avenues, Philadelphia, has awarded a contract to Jacob Y. Loux, Fifteenth Street and Hunting Park Avenue, for a power house and automobile service building for company cars, in connection with a new two-story addition to his wood-working plant, on Indiana Avenue.

The Crescent Insulated Wire & Cable Co., Olden and Taylor streets, Trenton, N. J., has filed plans for a one-story addition to cost about \$20,000.

The City Council, Trenton, N. J., will build a new ice-manufacturing and refrigerating plant at its municipal colony. C. A. Klemann, First National Bank Building, is architect.

The H. C. Frick Coal & Coke Co., Scottdale, Pa., will build a new tipple at its local coal properties.

W. S. Barstow & Co., 50 Pine Street, New York, operating the Metropolitan Edison Co., Reading, Pa., and other utility properties, have acquired the York Haven Water & Power Co., York Haven, Pa. The property will be merged with the Metropolitan system, and extensions and improvements made in electric plants and lines. The Metropolitan company is disposing of a bond issue of \$4,555,000, the proceeds to be used in part to effect the merger, and for expansion in power plant and system.

The Wearwell Tire Co., New Castle, Pa., is having plans prepared for a one-story works, 50 x 150 ft., to cost about \$50,000, for the manufacture of automobile tires. Earl & Altschuler, Dean Building, are architects.

The Chester Dairy Supply Co., Hyatt and Ninth streets, Chester, Pa., manufacturer of dairy machinery and parts, will install new metal-working equipment.

The Pennsylvania Power & Light Co., Wilkes-Barre, Pa., will build a new one-story power house at Ashley Plane, Ashley, near Wilkes-Barre.

The Board of Directors, Dunwoody Home, Chester, Pa., will soon commence the erection of a new power house at the institution. Clarence H. Brazer, Chester, is architect.

A vocational department will be installed in the new junior high school to be erected by the Board of Education, Wilkes-Barre, Pa.

A vocational department will be installed in the two-story high school to be constructed at Allentown, Pa., to cost about \$900,000. H. C. Richards, 605 Chestnut Street, Philadelphia, is architect.

Fire, April 5, destroyed the electric power plant of the Consolidated Light & Power Co., Hummelstown, Pa., with loss estimated at about \$60,000. It will be rebuilt.

A vocational department will be installed in the three-story high school to be erected at Leechburg, Pa., estimated to cost \$250,000, plans for which are being prepared by W. G. Eckles, New Castle, Pa., architect.

The Williamsport Ice & Cold Storage Co., Williamsport, Pa., is planning the erection of a new one-story ice-manufacturing plant at the foot of Center Street. Emanuel Fisher is president.

A vocational department will be installed in the two-story high school to be erected at Gloucester, N. J., estimated to cost \$350,000. Lackey & Hettie, 5 Hudson Street, Camden, N. J., are architects.

The Hero Mfg. Co., Philadelphia, which during the war engaged in the manufacture of gas masks and later converted its plant and equipment to the manufacture of automobile parts, held a public auction on April 5, at which about 50 machine tools, mostly of the smaller types, were disposed of at fairly good prices. The plant occupied by the Hero Mfg. Co. has been purchased by the Budd Wheel Corporation, Philadelphia, which will utilize it as a part of its wheel works.

New England

BOSTON, April 10.

Sales of machine tools in this district continue on a small scale. The most significant news the past week is that a New England manufacturer of small automatic screw machines has disposed of a large stock held for some time and is now quoting on two months' delivery. Practically all of these machines were sold to manufacturers of radio apparatus. It is now believed the bulk of small tool buying by radio manufacturers is over, as new companies coming into the field are able to place contracts for their product with established metal working concerns. The most important sale last week by local interests was a 10-ton crane with a 50-ft. span to the Palmer Steel Casting Co., Holyoke, Mass., which also closed on structural punch and shear equipment and on a Cleveland rotary planer. A nearby carwheel manufacturer bought a 200-ton wheel press, several 4-in. pipe machines were sold to Massachusetts manufacturers, and a 16-in. shaper to a Chicopee interest. Business otherwise was confined to a few used machine tools with a small amount of capital involved. The Matthews Mfg. Co., Worcester Mass., pressed metal goods, is in the market for a used Heald style 22, 12-in. revolving surface grinder with magnetic chuck, and the Richard T. Green Co., Chelsea, Mass., for heavy bending rolls and a 500-ft. air compressor.

A Western maker of upright drills has reduced prices from 5 to about 25 per cent, according to the style of machine. Local machine tool dealers are working on a large number of prospects, none of which involve any list of importance, and it is believed some orders will materialize this month.

High speed and carbon drills have been reduced about 10 per cent in price.

The Whitin Machine Works, Whitinsville, Mass., textile machinery, has awarded contract to the Aberthaw Construction Co., Boston, for a manufacturing unit and other improvements to cost \$500,000.

The American Radio & Research Co., Medford, Mass., plans to erect a one-story addition, 60 x 120 ft.

The United States Spring Bed Co., Birnie Avenue, Springfield, Mass., contemplates the erection of additions, 66 x 102 ft. and 50 x 102 ft., respectively.

The Commonwealth Envelope Co., Worcester, Mass., capitalized for \$50,000, has taken a charter to manufacture envelopes, paper, containers and accessories and machinery. The plant will be at 1446 Grafton Street, Worcester. Narcisse J. Lavigne is president, and Charles H. Rosseel, treasurer.

The assets of the Hartford Automotive Parts Co., Hartford, Conn., will be sold as a going concern at auction May 3, which means that the automatic screw machines, chucking machines, gear cutters, lathes, milling machines, broaching machines and other machine tools, will not be thrown on the market, as anticipated.

The Middlesex Machine Co., Paige Street, Lowell, Mass., has been reorganized and incorporated under State laws, with a capital of \$60,000, to manufacture plumbing and pipe supplies. A new plant will be erected at 40-48 Lee Street. The personnel of the corporation remains the same.

The National Can Co., 36 Washington Street, Boston, manufacturer of containers, etc., has plans under way for a new two-story factory on Locust Street, South Boston, 92 x 160 ft., with adjoining buildings, 20 x 60 ft. and 20 x 40 ft., respectively, estimated to cost \$125,000, including equipment. A. A. Browne, 7 State Street, is architect.

A vocational department will be installed in the two-story high school, 201 x 230 ft., to be erected at Millinocket, Me., to cost about \$450,000. H. S. Coombs, 11 Lisbon Street, Lewiston, Me., is architect.

A one-story power house will be erected by the board of directors, Elliott Community Hospital, Keene, N. H., in connection with a new three-story hospital. Kendall, Taylor & Co., 93 Federal Street, Boston, are architects.

The Edison Electric Illuminating Co., 70 State Street, Boston, has completed plans for a new power plant at 776 Summer Street, comprising two buildings to cost \$200,000 and \$75,000, respectively.

The Union Street Railway Co., New Bedford, Mass., will install a turbo-generator, condenser and auxiliary apparatus at its electric power plant.

Fire practically destroyed the plant of the New Idea Mfg. Co., at 17-23 Canal Street, Providence, R. I., March 30, causing damage of between \$35,000 and \$50,000. It manufactures novelties.

The new plant of the Victor-Page Motor Corporation, Farmingdale, L. I., to be erected at Stamford, Conn., has been started by the Truscon Steel Co., New York. The

initial structure will be one-story, 60 x 200 ft., of brick and steel.

William C. Viall, East Providence, R. I., is planning a one-story 100 x 60 garage and repair shop, 60 x 100 ft., on Broadway and Gosvenor Avenue, in the near future.

Chicago

CHICAGO, April 10.

A gradual gain in both inquiries and orders is reported and the sentiment of dealers is more cheerful because of the revival in allied industries, particularly the steel business. While machine tools always lag behind other commodities in a period of industrial recovery, the improvement in other lines will, it is felt, be reflected in a commensurate betterment in demand for metal-working equipment in the course of a few months. Purchases by industrial users still consist largely of one or two machines. The Northwestern Steel & Iron Works, Eau Claire, Wis., whose plant was partially destroyed by fire recently, has bought three turret lathes and an engine lathe.

The railroads are conspicuous because of their inquiries, but continue to postpone buying from week to week. The Chicago, Burlington & Quincy has taken bids on a new shop at Denver and is expected to issue an inquiry soon for the equipment needed. An extensive list from the Illinois Central is also looked for. The Santa Fe has added the following items to its outstanding list:

One 16-in. x 6-ft. heavy duty tool room lathe with relieving taper attachment and draw-in attachment.

One 16-in. x 6-ft. or 18-in. x 8-ft. engine lathe with taper attachment.

One 20-in. x 12-ft. or 30-in. x 12-ft. engine lathe with taper attachment.

One No. 60 or 61 Heald cylindrical grinder.

One carwheel boring machine.

One 6-ft. plain radial drill.

One upsetting machine.

One motor-driven shear.

One swaging machine for swaging ends of locomotive flues, 2-in. to 5½-in., after welding.

One No. 4 Cincinnati horizontal universal milling machine.

One 40-in. Bullard vertical turret lathe.

One Ryerson or equivalent flue-testing machine, capacity up to 5½-in. flues.

One 24-in. x 10-ft. motor-driven quick change gear tool room lathe.

One Ryerson or equivalent pneumatic flue welding machine, capacity 2-in. to 4½-in. flues.

One Ryerson or equivalent single pneumatic flue welding machine for superheater flues, 2-in. to 5½ in.

One Morton 36-in. draw-cut shaper with one rotating head for slotting 10-in. to 15-in. driving boxes.

One hot saw and tube expanding machine.

One flue cutter for cutting safe ends.

One automatic safe end cutting off machine.

One superheater hot saw and tube expander.

One sand blasting equipment.

One No. 156 Fay & Egan cabinet planer or equivalent (wood-working).

One No. 77 American or equivalent planer and matcher (wood-working).

One 5-in. x 14-in. outside molding machine.

The Whiting Corporation has taken an order for a 15-ton pillar crane for the Illinois Central at Baton Rouge. The Wisconsin Steel Works, Torrence Avenue and 106th Street, Chicago, will install a traveling crane coal bridge to cost \$140,000.

Building permits issued in Chicago during the month of March exceeded practically all previous records. They covered 1327 buildings with a frontage of 45,684 ft., involving a cost of \$19,333,900. Only one month in the city's history shows a greater involved cost, namely August, 1911, when permits for buildings to cost \$26,200,500 were issued. The record for the first three months of this year is also the best in a decade, 2418 permits being issued, involving \$1,650 ft. of frontage and costing \$40,819,250. The best previous first quarter in point of frontage was that of 1916 when permits for 73,594 ft. were issued, and the best previous first quarter from the standpoint of cost was that of 1920, which involved \$28,699,800.

George H. Koon, 47 South St. Johns Street, Highland Park, Ill., is taking bids through an architect on a one-story automobile building, 50 x 140 ft., at Laurel and First streets, to contain automobile showroom, garage and repair shop and to cost \$30,000.

The Hudson Motor Co. of Illinois, 2449 South Michigan Avenue, Chicago, has let contract for a three-story auto-

mobile salesroom and service building, 100 x 390 ft., at 2220-38 South Michigan Avenue, to cost \$300,000.

Peth & Goiler, 1851 Irving Park Boulevard, Chicago, have let a contract for a one-story machine shop, 22 x 100 ft., at 3918 North Western Avenue, to cost \$5,000.

The Crown Foundry Co., Herschel Street, East Peoria, Ill., recently incorporated with \$16,000 capital stock, is constructing a plant, 50 x 124 ft., and will manufacture gray iron, chilled and semi-steel castings. Equipment required includes one double-end grinding machine, two 700-lb. capacity trolley ladles, one 1000-lb. capacity platform scale, one 2000-lb. capacity platform or crane scale, one 2000-lb. capacity electric hoist, fire brick and clay and all small tools for a foundry to employ 15 molders. The officers include H. E. Hire, Frank Barr, O. E. Slater and J. D. Armstrong.

The State Mfg. & Engineering Co., 2826 West Lake Street, Chicago, has been incorporated with \$20,000 capital stock to take over the business of the State Pattern & Machine Co. The company will manufacture patterns, tools, dies and jigs, wood-working and special machinery. In addition to the machinery taken over from the State Pattern & Machine Co., the new organization is in the market for a punch press, a shaper, a lathe and a tool grinder. Officers include George Eiermann, president; George Ramquiet, vice-president; Robert Carlson, treasurer; Victor Fehrm, secretary.

The Schillo Proctor Co., 2415 West Fourteenth Street, Chicago, has been incorporated with \$14,000 capital stock to take over the business of the Schillo-Vogt Co., manufacturer of structural and ornamental iron. The reorganization was undertaken because of the recent death of an officer of the old company.

The L. A. Althoff Mfg. Co., Inc., Laporte, Ind., recently incorporated, is an outgrowth of the L. A. Althoff Co. of Illinois, having taken over the entire assets and liabilities of the latter company. The new corporation has just completed a plant, which is fairly well equipped, although a gang drill, spot welder and a few more drill presses are required. The company's output consists of gas plates, gas ranges and small heating stoves.

The Beaubien Mfg. Co., manufacturer of typewriter specialties, 347 St. Johns Court, Chicago, has let contract for a one-story factory, 28 x 118 ft., at that address, to cost \$10,000.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, will erect a new power plant at Broadway and Washington Street, Aurora, Ill., to cost about \$100,000. William T. Krausch, company address, is architect.

A vocational department will be installed in the four-story junior high school to be erected at McCook, Neb., 62 x 120 ft., estimated to cost about \$125,000. George A. Berlinghof, 14 Orpheum Building, Lincoln, Neb., is architect.

The U. & J. Carburetor Co., 510 West Van Buren Street, Chicago, manufacturer of carburetors and other ignition equipment, will install a number of machine tools at its plant, including lathes, drills, shapers, milling machine, etc., as well as bench tools.

Michaelson & Rognstad, architects, 3815 West Congress Street, Chicago, are taking bids for a one-story foundry, 70 x 80 ft., and are completing plans for a machine shop and other buildings to comprise the same plant. The owner's name will be announced later.

The Continental Rubber Products Co., Denver, Colo., recently organized, is negotiating for a local site for the erection of a new plant to manufacture automobile tires and other rubber products, to cost in excess of \$100,000. A. E. Sidnell is president and treasurer.

The Central Illinois Public Service Co., Harrisburg, Ill., will build a one-story addition to its electric generating plant, 83 x 110 ft. Sargent & Lundy, 72 West Adams Street, Chicago, are engineers.

The Minneapolis Crushed Stone Co., 520 Metropolitan Bank Building, Minneapolis, Minn., will purchase machinery for a stone-crushing, washing, screening and drying plant. A. D. Hoar is president.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, will build a second unit to its power plant in the Calumet district, estimated to cost close to \$7,000,000. Later a third unit will be constructed, making a total station output of 270,000 hp. Marshall & Fox, 721 North Michigan Avenue, are architects.

The Globe Portland Cement Co., 416 McKnight Building, Minneapolis, Minn., will soon break ground for the first unit of its plant at Dubuque, Iowa, to be followed by a second unit later. It is estimated to cost about \$1,600,000, including machinery. The C. L. Pillsbury Co., 1200 Second Avenue, South, Minneapolis, is engineer.

The Common Council, Alexandria, Minn., will install new equipment at its municipal electric plant to cost about \$30,000. The C. L. Pillsbury Co., 1200 Second Avenue, South, Minneapolis, Minn., is engineer.

The Water & Light Board, Austin, Minn., will rebuild its municipal electric power plant, to be one and one-half stories, 60 x 85 ft., estimated to cost about \$100,000, including equipment. The C. L. Pillsbury Co., 1200 Second Avenue, South, Minneapolis, Minn., is engineer.

Buffalo

BUFFALO, April 10.

The Board of Education, Telephone Building, Buffalo, will take bids until April 19, for equipment and supplies for the manual training school, including a quantity of wood-working tools, screws, nails, etc., abrasive supplies, sheet metal and other material. D. J. Sweeney is deputy superintendent.

The board of directors, Canisius College, Jefferson and Main streets, Buffalo, will take bids early in June for a three-story and basement engineering and mechanical building, 60 x 180 ft., plans for which are being prepared by Bley & Lyman, 250 Delaware Avenue, architects.

John Zwillig, 222 Mulberry Street, Buffalo, has plans under way for a one-story sheet-metal working plant.

The Board of Education, Holland Patent, N. Y., will purchase machine tools and other equipment for the vocational department at the high school. D. B. Lisle is in charge.

The city has notified all steam railroads that the recent ordinance passed by the City Council, Buffalo, covering the elimination of steam-operated roads in the municipality will become effective Jan. 1, 1923, and that required electrification must be made prior to that time. The work will include power plants, substations, lines, etc., and is estimated to cost in excess of \$8,000,000. The different railroads affected are the New York Central; Lehigh Valley; Delaware, Lackawanna & Western; Pennsylvania; West Shore; Michigan Central; Buffalo, Rochester & Pittsburgh; Grand Trunk; Nickel Plate; Wabash; and the Canadian Pacific, all maintaining local offices.

A vocational department will be installed in the new high school to be erected at Black Rock, near Buffalo, estimated to cost about \$500,000.

John P. Sullivan, Buffalo, operating an artificial ice-manufacturing plant at Broadway and Jefferson Street, is having plans prepared for an addition, estimated to cost about \$50,000.

The Board of County Supervisors, Binghamton, N. Y., will purchase machine tools and other equipment for installation at the County machine and repair shops. J. R. Jewell is purchasing agent.

The Board of Directors, Cornell University, Ithaca, N. Y., will commence the immediate erection of a one-story power house at the institution.

The Educational Department, Y. M. C. A., Rochester, N. Y., is planning for the installation of machine tools, wood-working equipment, etc., for use in the vocational study classes. H. P. Lansdale, general secretary, is in charge.

A vocational department will be installed in the high school to be erected at Perry, N. Y., estimated to cost about \$200,000.

A vocational department will be installed in the high school to be erected at Medina, N. Y., to cost about \$400,000. H. W. Robbins, Cook Building, Medina, is in charge.

The Magic City Ice Co., Endicott, N. Y., will build a new one-story ice-manufacturing plant. A list of equipment is being arranged.

Pittsburgh

PITTSBURGH, April 10.

Recent announcement by the Pennsylvania Railroad of its intention to spend \$8,000,000 in this district does not encourage hopes of orders for machine tools. Details of how this sum will be spent have not been given out, but it is believed it will be devoted chiefly to track betterments, notably in the Conemaugh division. There is a fair amount of day to day buying of individual tools, usually out of dealers' stocks, but inquiries the past week have become fewer and there is a dearth of lists. Railroad equipment manufacturers in this and nearby districts are busier than before in almost two years, but are not adding to their equipment nor as yet doing much replacement. The Dillon Brothers Machine Co., Wheeling, W. Va., is a prospective buyer of some forging hammers and other tools in connection with a new machine and forging shop which it will build at Bridgeport, Ohio. The Romisch Mfg. Co., Morgantown, W. Va., also is likely to be in the market soon, as it is understood this company is well along in its plans for the

reconstruction of its works, partially destroyed by fire some time ago.

Some activity still is observed in cranes. The Pittsburgh Steel Co. has closed for two 5-ton overheads with the Alliance Machine Co., Alliance, Ohio. The Jamestown Malleable Products Corporation, Jamestown, N. Y., has bought a 5-ton 3-motor, 28-ft. Pauling & Harnischfeger crane and the Northern Engineering Works, Detroit, has taken a 5-ton, type E trolley for the Connellsburg Mfg. & Mine Supply Co., Connellsburg, Pa. The West Penn Power Co. has placed the order for a 110-ton crane for its Windsor, W. Va., plant with the Cleveland Crane & Engineering Co., Wickliffe, Ohio, which has also been awarded a 40-ton overhead crane for the Ohio works of the American Sheet & Tin Plate Co., McKeesport, Pa. Nothing yet has developed on the inquiries of the Standard Steel Car Co. and the Pittsburgh-Des Moines Steel Co. Low prices still are being quoted on cranes and costs do not seem to be getting much consideration in the desire for orders. The market also favors buyers of machine tools.

Freight-handling and conveying machinery will be installed in the six-story warehouse, 150 x 250 ft., to be erected by the Johnstown Terminal Warehouse Co., Johnstown, Pa., estimated to cost \$300,000, contract for which has been awarded to the William Steele & Sons Co., Philadelphia.

A vocational department will be installed in the new junior high school to be erected at Oil City, Pa., estimated to cost about \$350,000.

The Chesapeake Coal Co., Barrackville, W. Va., is planning for the installation of electrical and other machinery at its local properties and at Grant Town, W. Va., lately acquired. T. H. Johnson, Bellaire, Ohio, is president.

A vocational department will be installed in the two-story and basement high school to be erected at Logan, W. Va., for which construction bids have been asked. R. M. Bates, Huntington, W. Va., is architect.

The American Thermos Bottle Co. of West Virginia, Huntington, has been organized by officials of the American Thermos Bottle Co., Madison Avenue and Forty-sixth Street, New York, with capital of \$200,000, to operate a local plant lately completed. Tentative plans are under consideration for an addition, to provide about 100,000 sq. ft., of additional floor space.

The Coshocton Iron Works, Axleton Street, Monongahela, Pa., will install one 10-ton, one 5-ton and two 2-ton cranes at its plant.

The American Coal Co., Beckley, W. Va., will commence the immediate construction of a new tipple, with capacity of about 400 tons per hour.

A vocational department will be installed in the new junior high school to be constructed at Corry, Pa., to cost about \$100,000.

A vocational department will be installed in the two-story and basement junior high school to be erected at Charleston, W. Va., estimated to cost \$250,000. Warne, Tucker & Patterson, Masonic Building, Charleston, are architects.

Cincinnati

CINCINNATI, April 10.

Steady but slow improvement is reported by machine tool manufacturers in this district. During the week just closed one lathe manufacturer quoted on approximately \$25,000 worth of business, the largest single inquiry being for seven machines. The inquiries came from many different parts of the country and indicated that purchases may shortly be made. One feature of the trade is the marked improvement in inquiries from the South, a New Orleans dealer during the week having sent out lists calling for eight lathes for prompt shipment. While no railroad buying was reported, lists which have been out for some time are again becoming active and it is expected that the New York Central, Illinois Central and Santa Fe will shortly purchase the greater part of their requirements.

While at first it was feared that the coal strike would put a damper on the machine tool business, some manufacturers are of the opinion that it will have a tendency to hasten the closing up of inquiries now current.

The radio industry is responsible for a demand for small tools, and local dealers and manufacturing interests report sales as very fair.

The Corcoran-Victor Co., manufacturer of automobile lamps and accessories, has purchased property adjoining its plant on Colerain Avenue, Cincinnati, with a view to taking care of future extensions. The premises for the present will be used for storage purposes.

The Precision Equipment Co., Cincinnati, manufacturer of radio equipment, has leased an upper floor of the Orpheum Theatre Building, East McMillan Street, and will make

alterations for manufacturing purposes. A force of 200 will be employed. The present plant of the company will be used for laboratory purposes.

The plant of the Quad Stove Mfg. Co., Columbus, Ohio, was damaged about \$15,000 by fire on April 6.

The Dayton Power Light Co., Dayton, Ohio, has awarded contract to the Pittsburgh Bridge Co., for a new power house at Miller's Ford. Equipment costing approximately \$300,000 will be installed.

The Huffman Mfg. Co., Dayton, has been organized to manufacture bicycles. Horace M. Huffman, formerly vice-president Davis Sewing Machine Co., is president and general manager of the new company, which has opened temporary offices at 305 Callahan Bank Building, Dayton.

The Ohio Cash Register Co., Dayton, has been incorporated with a capitalization of \$300,000 to manufacture a low-priced cash register. George N. Lingham, William M. Carroll, Fowler Mold and Andrew Iddings are the incorporators. The company for the present will occupy a portion of the plant of the Carroll Engineering Co., Xenia Avenue, and expects to commence production in the near future. George N. Lingham heads the company, and William M. Carroll, president Carroll Engineering Co., will be general manager.

Cleveland

CLEVELAND, April 10.

With scattered buying, mostly of single tools, machinery sales are holding up at about the same volume as in March. The stimulus of the radio industry is still noticeable, as the manufacture of radio equipment either directly or indirectly has resulted in a number of orders, mostly for automatic screw machines. Manufacturers of screw machine products are making large quantities of parts for radio equipment and one manufacturer during the week purchased three automatic screw machines. The outlook for buying by the automotive industry appears more promising. The Hudson Motor Car Co., Detroit, which recently bought two turret lathes, has purchased two more. A Detroit manufacturer has an inquiry out for 12 to 15 automatic screw machines and an order is looked for from this source.

Little railroad buying is developing. There seems to be a disposition among some railroads to expend considerable money for repair parts for old equipment rather than to purchase new tools. The contention by some that price reductions do not stimulate buying is answered by one manufacturer who, after reducing prices, was able to speedily close up some business that had been pending for months.

The leading manufacturer of steam shovels reports a larger volume of sales during March than in any of the previous 18 months. The demand for locomotive cranes is somewhat more active. The Whiting Corporation has taken a locomotive crane for the Pennsylvania Tank Car Co., Sharon, Pa., and a 12-ton crane, mounted on a crawling tread and operated by a gasoline motor, for the Cleveland Waterworks Department.

Manufacturers of road-building equipment, including concrete mixing and handling equipment, state that sales have become very good the past week or two, and that they expect a good volume of business for the year.

The twist drill market is reported as being in a more demoralized condition in respect to prices than in several years. Regular prices have virtually disappeared. While some makers are now quoting carbon drills at 70 and 5 per cent off list and high speed drills at 50 and 10 per cent off list, these prices are being shaded at least 5 per cent. While there are still surplus stocks in the hands of jobbers and consumers which are being offered at price concessions, the price cutting appears to be largely due to competition among drill manufacturers.

The Monarch Machine Tool Co., Sidney, Ohio, is in the market for a plant sprinkler system.

The Cooper Spring Co., 2220 Center Street, Cleveland, is in the market for a Brinell hardness testing machine.

The Sterling-Knight Co., recently organized by Cleveland men, has purchased the plant of the Accurate Machine Co., Coit Avenue and East 131st Street, Cleveland, for manufacturing purposes. It includes an office building and a machine shop with 44,000 sq. ft. of floor space. P. H. Withington, is president of the Sterling-Knight Co., and J. G. Sterling, vice-president and engineer.

The C. G. Spring Co. of Ohio has been organized by Christian Girl and will occupy a plant at 1830 East Sixty-third Street, Cleveland. This will be a finishing and assembling plant principally for the manufacture of automobile bumpers. The new company succeeds the Cleveland branch of the C. G. Spring Co., Kalamazoo, Mich., of which Mr. Girl is president. He is also president of the new Cleveland company. H. H. Burton is vice-president and secretary, and A. E. Homan, sales manager and treasurer.

The H. B. Young Motor Truck Co., Geneva, Ohio, has acquired the plant of the Simplicity Products Mfg. Co., Madison, Ohio, and will move the equipment to the Geneva plant, which will engage in both the manufacture of trucks and power plant equipment.

The Ravenna Steel Co. is being organized in Ravenna, Ohio, which contemplates taking over the plant of the United Roll & Foundry Co., Ravenna, to manufacture a type of steel reinforcing for road construction, designed by W. D. Forsyth, Cleveland.

The National Pump & Mfg. Co., York, Pa., has purchased a plant in Chillicothe, Ohio, and will install equipment for the manufacture of gasoline and oil pumps for use at filling stations.

The Electric Alloy Steel Castings Corporation, Warren, Ohio, contemplates the erection of a plant shortly. It will be 110 x 280 ft. and equipped for the manufacture of castings up to 15 tons. H. L. Coxey, Massillon, Ohio, is president, and A. F. Ranck, Akron, Ohio, secretary.

The Anderson Piston Co., Sandusky, Ohio, has acquired the Vim Motor plant of that city and will place it in operation shortly for the manufacture of automobile pistons. H. H. Elwood is president.

The Pfaler Mfg. Co., Leipsic, Ohio, recently organized by William Z. Pfaler, has had plans prepared for a new factory.

C. O. Miniger and other Toledo men have made an offer to purchase the plant and business of the Electric Auto-Lite Corporation, Toledo, which is at present being operated by Mr. Miniger as receiver, as a result of the receivership of the Willys Corporation, Elizabeth, N. J. The consummation of the sale is now awaiting the approval of the stockholders and the Federal court.

A number of stockholders of the Standard White Metals Co., Elyria, Ohio, have filed a petition asking for a dissolution of the company. Walter Watts has been appointed referee.

Baltimore

BALTIMORE, April 10.

The United States Radiator Corporation, Detroit, has had plans prepared for a one-story building, 80 x 172 ft., on Frisby Street, Baltimore, as a branch factory. It will cost about \$27,000.

The Mebane Wrench Co., 123 Third Street, Newton, N. C., is planning the erection of a new one-story factory, with initial daily production of about 300 wrenches of special adjustable type. C. H. Mebane, Jr., is general manager.

The Common Council, South Hill, Va., is arranging a bond issue of \$125,000 for the construction of a municipal electric light and power plant.

The General Purchasing Officer, Panama Canal, Washington, will receive bids until April 21 for brass chain bolts, oil-handling pump, water meter testing outfit and other equipment, as set forth in circular 1475. A. L. Flint is purchasing officer.

The Board of Directors, Union Memorial Hospital, Thirty-third and Berkley streets, Baltimore, will build a new power house at the institution in connection with a new six-story hospital to cost \$1,000,000. Joseph E. Sperry, Calvert Building, is architect; Charles L. Reeder, 916 North Charles Street, is engineer.

The Reedy River Power Co., Laurens, S. C., has plans under way for the erection of a new power plant for auxiliary service.

The Woodstock Mfg. Co., Charleston, S. C., is arranging a list of machinery for installation at its plant for the manufacture of fiber containers and kindred specialties, to include motors, transmission apparatus, etc. J. F. Williams, Center Street, is president.

The Friedman's Ice & Cold Storage Co., Savannah, Ga., will rebuild its two-story ice manufacturing and cold storage plant, 90 x 160 ft., recently destroyed by fire.

The Greenville Plating Co., Greenville, S. C., recently organized, has plans under way for the establishment of a factory to manufacture metal-plated products. T. H. Machen heads the company.

The Harvey & Sisler Warehousing Corporation, Wilmington, Del., recently organized, is planning for the construction of an ice and cold storage plant, in connection with a warehouse to cost \$200,000. Morton Harvey, 1404 Gilpin Street, is president, and Perlee Sisler, first vice-president.

The Georgia Railway & Power Co., Dalton, Ga., is planning for the construction of a one-story power house, estimated to cost about \$25,000.

The Columbus Electric & Power Co., Columbus, Ga., is being organized by officials of the Columbus Electric Co., to form a merger of the latter company with the Columbus Railroad Co. and the Columbus Gas Light Co. The consolidated

company will have a capitalization of about \$10,000,000. Plans are being considered for extensions and improvements in the main electric power plant and system.

An ice-manufacturing plant, with cold storage and refrigerating department, will be erected by the Takoma Park Ice & Ice Cream Co., Takoma Park, near Washington, estimated to cost close to \$50,000. The building contract has been let to D. E. Nichol, Continental Trust Building, Washington. A. G. Bailey is president, and John Humphreys, secretary, treasurer and general manager.

A vocational department will be installed in the proposed high school to be erected by the County Board of Education, Lexington, N. C., estimated to cost about \$225,000.

The Baltimore Cement Products Co., Baltimore, will erect a plan at Culver Street, Lauraville, Baltimore, for the manufacture of cement products. Herbert L. Bowen is president.

The Baltimore Coppersmith Co., 1914 Aliceanna Street, Baltimore, has taken a former foundry building of the Weiskittel Foundry at Washington and Fountain streets and will put it in operation. A. Larsen is president.

The Baltimore Gas Appliance Mfg. Co., Bayard and Hamburg streets, is extending its plant and has additional improvements under consideration. H. W. Hunter is president.

Detroit

DETROIT, April 10.

The Stafford Roller Bearing Co., Lawton, Mich., is completing plans for a new local factory, 40 x 60 ft.

Fire, April 2, destroyed the plant of the Weis Fiber Container Corporation, Monroe, Mich., with loss estimated at close to \$1,000,000, including machinery, power equipment, etc.

The Reiber-Kolz Co., Adrian, Mich., recently reorganized, manufacturer of deflector spot lights and kindred products, has tentative plans under consideration for extensions and improvements, with equipment to provide for increased output.

The Dort Motor Car Co., Flint, Mich., is disposing of a stock issue totaling about \$1,500,000, the proceeds to be used in part for extensions and improvements in its plant. Effective, May 1, an increased production schedule will be placed in effect, advancing from 1500 cars monthly to 2000 per month.

A vocational department will be installed in the new high school to be erected at Houghton, Mich., estimated to cost about \$200,000. Van Leyen, Schilling, Keough & Reynolds, 3440 Cass Avenue, Detroit, are architects.

The Bay City Freezer Co., Bay City, Mich., recently organized with a capital of \$120,000, is arranging for the erection of an ice-manufacturing and refrigerating plant. The City Chamber of Commerce is interested in the project.

The Ironwood & Bessemer Railway & Light Co., Bessemer, Mich., has been granted permission to issue preferred stock for \$233,000, the proceeds to be used for extensions and improvements in electric power plant and system.

The Citizens' Light & Power Co., Adrian, Mich., will install new equipment at its power house to double, approximately, the present capacity. The expansion will cost about \$100,000.

The Winterfield Light & Power Co., Tustin, Mich., will construct a new hydroelectric power plant in Winterfield County, with transmission system to include Tustin, Leroy, Avondale, Ewart and other places in this section. John Perry is president, and W. L. Kinney, general manager.

Indiana

INDIANAPOLIS, April 10.

A vocational department will be installed in the two-story high school, 70 x 120 ft., to be erected at North Manchester, Ind., estimated to cost about \$150,000. C. R. Weatherhogg, Citizens' Trust Building, Fort Wayne, Ind., is architect.

The National Lamp Works of the General Electric Co., Nela Park, Cleveland, Ohio, is planning for the erection of new works at Glenwood Park, New Albany, Ind., to cost about \$1,000,000.

The Southern Indiana Gas & Electric Co., Evansville, Ind., has completed plans for an addition to its power plant, with other improvements, estimated to cost about \$500,000, including equipment. It will build a new gas retort at its gas works. Frank J. Haas is general manager.

The Studebaker Corporation, South Bend, Ind., has plans under way for a new power house at its automobile works, to cost about \$750,000. It will also construct a storage and shipping building, provided with crate handling and conveying machinery, estimated to cost approximately \$500,000. Production is being increased at the plant, and commencing in May closed type cars will be manufactured on a basis of 100 per day.

A vocational department will be installed in the two-story high school, 170 x 215 ft., to be erected at Marion, Ind., to cost about \$300,000. H. G. Bowstead, Glass Building, is architect.

The Public Service Commission has ordered the Indiana Power Co., Bloomfield, Ind., to install new pumping machinery and other equipment at its power house.

R. N. Edwards & Co., Union Trust Building, Indianapolis, architects, are preparing plans for a new machine shop, power plant and one and three-story mechanical plant to cost about \$250,000, including equipment. The name of the owner will be announced later.

The Heslar Radio Corporation, Indianapolis, recently incorporated with \$100,000 capital stock, has bought the Capital Radio Supply Co. It plans to manufacture radio supplies and is seeking a site for a factory. O. F. Heslar is president.

The Bucyrus Steam Shovel Co., Evansville, Ind., has completed a large model steam shovel to be shipped to Japan. The company is planning an addition to its works.

Milwaukee

MILWAUKEE, April 10.

With a slight but steady increase in inquiry, and sales slowly gaining volume, the outlook for the machine-tool industry is regarded locally as the most promising in nearly two years. The call for milling machines from automotive and agricultural equipment industries particularly lends encouragement, especially as the latter interest has been out of the market for more than two years. Present sales are not yet notable, however, for the aggregate is still very small, but steady gains are being made.

The Obenberger Forge Co., West Allis, Wis., was chartered April 7 with an authorized capitalization of \$500,000, and will succeed the defunct John Obenberger Forge Co., Milwaukee. The new owners expect to resume the operation of the drop forge plant in West Allis shortly after April 15, having a considerable quantity of orders on hand. For the present no new equipment will be purchased save to cover necessary replacements. Adolph Weidner, attorney, 105 Wells Street, Milwaukee, represents the incorporators of the new concern.

The Northern Boiler & Structural Iron Works, Appleton, Wis., has plans by its chief engineer, Edward Kottke, for a complete new machine, boiler, fabricating and erecting shop, 80 x 100 ft., of brick and steel. It is to be erected on the site of the present shop, which will be enveloped and kept intact until the new building is completed. Among the new equipment to be purchased is one 5-ton and one 10-ton electric traveling crane and some miscellaneous tools. The investment will be about \$75,000 in all. William H. Timm is president and general manager.

The Hansen Canning Machine Co., Port Washington, Wis., has been incorporated with a capital stock of \$200,000 to manufacture special machinery, tools and equipment. The incorporators are O. Hansen, J. R. Dennett and P. F. Winner, all of Port Washington. The promoters are not prepared as yet to make public plans for production.

The Tomah, Wis., Iron Works & Garage, Inc., recently incorporated with \$30,000 capital stock, is a merger of the Tomah Iron Works and the Janke Machine & Garage Co., which have been consolidated into a general machine and repair shop, garage and service station. Officers of the new corporation are: President, R. S. Murray; vice-president, C. A. Murray; secretary, Carl A. Sweet; treasurer, W. W. Warren; director, H. M. Warren. The merger went into effect April 5.

The Republic Box Co., Marinette, Wis., sustained an almost total loss, estimated at \$125,000, by the destruction of its factory and power plant by fire of unknown origin on April 7. It is intended to reconstruct the plant at once. Nearly all of the machinery and equipment will require replacement.

The Munising, Mich., Motor Co. has awarded contract for a one-story garage addition, 50 x 142 ft., to be equipped as a service and repairshop.

The Stover Signal Engineering Co., Cleveland, Ohio, manufacturer of signal devices, has decided to relocate its plant and headquarters in Racine, Wis., where it intends to erect a factory this year. For the present parts will be made under contract with Racine metal-working shops and an assembling plant will be maintained in leased quarters. Paul A. Stover is president, and C. C. Mortensen, treasurer and general manager.

The Whitmore Machine & Foundry Co., Menasha, Wis., has booked a large order for special wire-weaving machines and auxiliary equipment for the H. E. McCloskey & Sons Co., manufacturer of wire products, New Haven, Conn.

The Board of Education, Stevens Point, Wis., is asking bids until April 21 for the construction of a new high school

with vocational training shops, designed by Robert A. Messmer & Brother, architects, 221 Grand Avenue, and estimated to cost \$175,000. Manual training equipment will be purchased later.

The Amplifier Co. of America, Eau Claire, Wis., has been incorporated with a capital stock of \$60,000 to manufacture phonographs, electrical devices, etc., principally a patented appliance for amplifying sounds, designed by Charles A. Clark, who with Clarence F. Funk, Peter D. Peterson, L. H. and Alvin M. Anderson, appears as incorporator. It is intended to equip a small shop in Eau Claire, equipment for which is now being contracted for.

The F. Rosenberg Elevator Co., 174 Reed Street, Milwaukee, manufacturer of freight and passenger elevators, has taken occupancy of its new shop and office buildings at 1645-1665 Richards Street, erected and equipped at a cost of more than \$135,000. The equipment of the original shop is now being transferred and will be supplemented by new tools and machinery, most of which has been purchased and is now being delivered.

The Neenah, Wis., Board of Education has received for approval plans prepared by Robert A. Messmer & Brother, architects, 221 Grand Avenue, Milwaukee, for a junior high and vocational training school, estimated to cost \$375,000 with equipment. Bids will be taken for the construction some time in April so that the institute will be ready to receive pupils at the beginning of the fall term. L. J. Pinkerton is secretary of the board.

G. A. Dollert, La Crosse, Wis., has engaged Parkinson & Dockendorff, local architects, to prepare plans for a public garage, sales and service station, one-story, 40 x 97 ft., with a one-story wing, 20 x 60 ft., of brick and concrete construction. It will cost about \$17,500, including shop equipment.

The R. Gunz Co., Muskego Avenue and Canal Street, meat packer, Milwaukee, will erect a three-story addition, 45 x 85 ft., of reinforced concrete, for cold storage warehouse purposes. Additional refrigerating equipment will be required. The architects are Lesser & Schuette, 82 Wisconsin Street.

The Hamacheck-Bleser Buick Co., 1102 Franklin Street, Manitowoc, Wis., expects to take bids April 15 for the erection of a new garage, sales and service building, 50 x 140 ft., two stories and basement, estimated to cost \$32,000. The architects are Smith, Reynolds & Brandt, Sheboygan and Manitowoc.

The Stockbridge, Wis., Sheet Metal & Plumbing Co. is a new corporation organized with a capital stock of \$25,000 by Carl Mischo and Nicholas Karis, Stockbridge, and Fred W. Dietrich, Fond du Lac, Wis., to manufacture cornices, ceilings and other sheet metal products, plumbing supplies, and to do general contracting in these lines.

J. W. Osborn, Waupaca, Wis., has plans for a new public garage and repairshop, 58 x 100 ft., two stories and basement, costing about \$28,000. Tools and fixtures are now being purchased.

The Flambeau Paper Co., Park Falls, Wis., has let the general contract to the C. R. Meyer & Sons Co., Oshkosh, Wis., for the reconstruction and enlargement of its paper and pulp mill at a cost of approximately \$110,000. Some new power and special paper manufacturing equipment will be required. Guy Waldo is president and general manager.

Charles H. Adams, secretary Board of Education, Eagle River, Wis., closes bids April 17 for the erection of a new high school, 80 x 121 ft., part three stories, containing manual training shops, gymnasium, etc. It will cost about \$160,000. The architects are Parkinson & Dockendorff, La Crosse, Wis.

The Gulf States

BIRMINGHAM, April 10.

At Old Tar, Fla., H. D. Keller and his two sons have taken over the business of heater manufacture. They have organized the Keller Heating Co. with the following officers: H. D. Keller, president; H. J. Keller, vice-president and treasurer; Louis B. Keller, secretary. In addition to heaters for citrus groves and truck farms, the company manufactures oil-burning apparatus for heating buildings by means of steam, hot water or hot air.

The Alexandria Oil & Refining Co., Alexandria, La., will construct an addition to its oil refining plant to double the present capacity. H. T. Clark is president.

The S. F. Bowser Co., Fort Wayne, Ind., manufacturer of oil tanks, oil storage systems, etc., will install equipment for the manufacture of a complete line of tanks and kindred products, at its new branch plant at 1815 North Market Street, Dallas, Tex.

The Texas Power & Light Co., Dallas, Tex., is negotiating with the City Council, Austin, Tex., for the purchase of the municipal electric power plant and system, with plans to

furnish service in this section in the future. Upon acquisition it is proposed to extend and improve the Austin power plant and lines.

The Cameron Water, Power & Light Co., Cameron, Tex., will make extensions and improvements in its electric power plant to cost about \$42,000.

The Arcadia Lumber Co., Arcadia, Fla., is planning to rebuild its plant, including saw mill and other structures, recently destroyed by fire with loss estimated at about \$60,000. The new mill will cost approximately a like amount, including equipment.

The American Ice Co., Dallas, Tex., will build a new cold storage and ice-manufacturing plant on Greenville Road. Plans have been completed.

The Empire Oil & Gas Co., St. Rose, La., operating the oil refinery of the Corson Petroleum Co., recently acquired, is planning the erection of an addition to cost in excess of \$800,000, including machinery.

The Southern Ice & Utilities Co., Texarkana, Tex., is having plans prepared for a new ice and cold storage plant at Broad and Oak streets, to cost about \$150,000, including equipment.

The Common Council, Utica, Miss., is arranging for a bond issue for the construction of a municipal electric light and power plant.

The William Gilmore Auto & Machine Co., Meridian, Miss., has awarded a contract to Witmore & Priester, Meridian, for a new one-story machine and repair works, 65 x 75 ft., to cost about \$50,000. Headquarters of the company are at 2116 Sixth Street.

The Cotton Belt Railway Co., Plano, Tex., has had plans prepared for an electrically operated coaling plant, with capacity of from 8 to 10 cars at one time.

The Texas Ice & Cold Storage Co., Dallas, Tex., has tentative plans in preparation for a new ice and cold storage plant. It is building an ice-manufacturing plant on North Market Street, designed for an initial capacity of about 140 tons per day.

A vocational department will be installed in the two-story and basement high school to be erected at Grenada, Miss., estimated to cost about \$120,000. R. A. Heavner, Jackson, Tenn., is architect.

The Orlando Water & Light Co., Orlando, Fla., is planning for the construction of a new central generating plant, extensions and improvements in lines, estimated to cost close to \$1,000,000, including machinery. Donald A. Cheney is general manager.

The Louisiana & Northwest Railroad Co., Homer, La., is arranging an appropriation of \$500,000, the proceeds to be used for extensions and improvements. The work will include expansion in machine and repair shops and the installation of new equipment, rolling stock, etc. Adam H. Davidson is treasurer.

The Treasury Department, Washington, will take bids until April 19 for the installation of a new ice-manufacturing and refrigerating plant in the hospital at Mobile, Ala. James A. Wetmore, Washington, is acting supervising architect.

The Cisco & Northeastern Railroad Co., Cisco, Tex., is perfecting plans for the erection of a new locomotive and car repair works. R. Q. Lee is president.

The Pacific Coast

SAN FRANCISCO, April 4.

The Public Service Commission, Los Angeles, will receive bids until May 2, for condensers and other equipment for the municipal power plants. James P. Vroman is secretary.

The Kay Bee Mfg. Co., Los Angeles, has plans nearing completion for a new factory on South Park Avenue for the manufacture of spotlights, signals and other electrical equipment.

The Samson Tire & Rubber Co., Compton, Cal., is having plans prepared for additions to cost about \$200,000, including equipment. A power plant will also be constructed.

The Bureau of Yards and Docks, Navy Department, Washington, will commence the immediate erection of a new machine shop at the naval base, San Diego, Cal.

S. S. Herrick, Adeline Street, Oakland, Cal., has filed plans for a new one-story machine shop at Eighteenth and Campbell streets.

The San Diego Consolidated Gas & Electric Co., San Diego, Cal., has plans under way for a new power house at Ash and Fourth streets, to cost about \$200,000. Requa & Jackson, 614 B Street, are architects.

The E. A. Gray Co., 510 South Pedro Street, Los Angeles, has awarded contract to the Austin Co., Pacific Electric Building, for a one-story and part three-story machine shop,

50 x 140 ft., at 2277 East Fifteenth Street, to cost about \$35,000, including equipment.

The American Aluminum-Metal Products Co., Burbank, Cal., will commence the immediate erection of its new plant, estimated to cost about \$100,000.

The Southern Sierras Power Co., Riverside, Cal., is completing plans for a new hydroelectric generating plant in the Mill Creek section. Work will commence this month.

A vocational department will be installed in the new high school to be erected by the Board of Education, Oxnard, Cal.

The Western Pipe & Steel Co., Seattle, Wash., has taken an option to purchase the shipyard property of Paterson & MacDonald for about \$150,000. The company plans the establishment of works for the production of riveted steel pipe, etc.

The Frantz Oil Corporation, Denver, Colo., Frank Frantz, president, a subsidiary of the Mutual Oil Co. of Wyoming, is planning for a new refinery at Spokane, Wash., with initial daily capacity of about 1000 bbl., estimated to cost approximately \$300,000.

The Eureka Hydro Electric Co., Eureka, Mont., is planning for the construction of a new hydroelectric generating plant on Graves Creek.

The City Council, McMinnville, Ore., is perfecting plans for the construction of a municipal hydroelectric power plant on the Nestucca River, estimated to cost in excess of \$300,000.

The Hedlund Box & Lumber Co., 803 North Stone Street, Spokane, Wash., is planning the erection of a new box factory to cost about \$75,000. A power house will also be erected. The company recently increased its capital from \$100,000 to \$500,000 for expansion. D. C. Hedlund is president.

The Spirit Lake Railway & Power Co., 110 East Twelfth Street, Vancouver, Wash., is arranging for the construction of two hydroelectric generating plants on the Green River and the Toutle River, Cowlitz County.

Louis Keurn, Portland, Ore., is having plans prepared for a one-story machine shop at East Second and Oregon streets. Ernest Kroner, Worcester Building, is architect.

The Central South

ST. LOUIS, April 10.

The Johnson Automobile Co., 3667 Olive Street, St. Louis, is taking bids for the erection of a two-story service and repair works, 50 x 52 ft., estimated to cost about \$50,000. W. P. McMahon, Title Guaranty Building, is architect.

The Broderick & Bascom Rope Co., 805 North Main Street, St. Louis, manufacturer of wire rope, cables, etc., is planning to rebuild its works recently destroyed by fire with loss estimated at about \$300,000, including equipment. The fire was the second that the plant has sustained since February, the first causing a loss of approximately \$75,000 and affecting about 25 per cent of capacity. The last fire has caused a suspension of operations until the plant is rebuilt.

A vocational department will be installed in the new high school to be erected at Wellington, Mo., plans for which are being prepared by William Mampe, 559 Sheldley Building, Kansas City, Mo.

Fire, April 5, destroyed the refinery of the Phillips Petroleum Co., Bartlesville, Okla., with loss estimated in excess of \$300,000, including machinery.

A vocational department will be installed in the three-story and basement high school, 78 x 134 ft., to be erected at Flat River, Mo., estimated to cost about \$125,000. J. H. Felt & Co., 800 Grand Avenue Temple Building, Kansas City, Mo., are architects.

The Automatic Water Pump Mfg. Co., 236 East High Street, Jefferson City, Mo., will take bids at once for machine tools, bench tools, wood-working equipment and other machinery for installation in its new plant, estimated to cost about \$100,000. B. F. Schuetz is president.

Fire, April 3, destroyed a portion of the main mill of the Arkansas Short Leaf Lumber Co., Pine Bluff, Ark., a subsidiary of the Long Bell Lumber Co., Kansas City, Mo., with loss estimated at about \$200,000, including machinery.

The Caddo River Power & Irrigation Co., Little Rock, Ark., is planning for the construction of a new hydroelectric generating plant on the Ouachita River, with ultimate capacity of 50,000 hp.

A two-story vocational shop will be erected at the Lathrop School, Wyandotte and Thirteenth streets, Kansas City, Mo., estimated to cost close to \$60,000.

The Belknap Hardware & Mfg. Co., Second and Washington streets, Louisville, is having plans revised for a twelve-story factory and warehouse, 204 x 285 ft., at First and Main streets, estimated to cost close to \$1,000,000. William Hey-

burn is president. Graham, Anderson, Probst & White, 80 East Jackson Boulevard, Chicago, are architects.

A vocational department will be installed in the proposed high school to be erected at Rush Springs, Okla., plans for which will be prepared at an early date.

The Kentucky Refractories Corporation, Covington, Ky., is planning for the construction of a new plant at Russell, Ky., for the manufacture of fire brick, furnace linings and other refractory products, estimated to cost about \$300,000, including machinery. A. J. Ivey is secretary and treasurer.

The Maryland Oil Co., Ponca City, Okla., has plans under way for an addition to its plant, to include new stills, steel tanks, pumping equipment, etc.

A vocational department will be installed in the two-story and basement high school to be erected at Pauls Valley, Okla., estimated to cost about \$100,000. Jewel Hicks, 19½ West Main Street, Oklahoma City, Okla., is architect.

The Green Light & Power Co., Clinton, Mo., has plans under way for an electric generating plant estimated to cost about \$150,000 with machinery. A distributing system will be constructed to include a number of places in this section.

The Dixie Power Co., Title Guaranty Building, St. Louis, has preliminary plans under way for the construction of a dam and hydroelectric generating plant on the Buffalo River, near Yellville, Ark., with initial capacity of about 20,000 hp.

A vocational department will be installed in the two-story high school to be erected at Bowling Green, Ky., estimated to cost \$100,000. Clifford Shopbell & Co., Evansville, Ind., are architects.

The Bell Coal & Navigation Co., Sturgis, Ky., is planning for the construction of a new tipple at its properties. It will also build a new power house and install electrically-operated mining machinery, conveyors, etc. William Herbert heads the company.

The Liberty Ice & Cold Storage Co., 410 Crutcher & Starke Building, Louisville, is arranging for the erection of a new ice-manufacturing plant, with initial capacity of about 200 tons per day.

Fire, April 3, destroyed a portion of the distributing plant of the Sapulpa Refining Co., Sapulpa, Okla., with loss estimated at about \$300,000, including steel storage tanks, pumping machinery, etc.

Canada

TORONTO, April 10.

The demand for machine tools in this district is gradually growing better. Numerous inquiries and a slight increase in sales give the market the appearance of activity, but there is still apparent a slight hesitancy on the part of buyers to issue big lists and send out orders for their entire requirements and many are buying only what is urgently needed. On the whole, however, while sales are chiefly for one or two machines to a customer, buying is spread over a wide range of territory and the general volume of business is quite satisfactory. Industrial activities are steadily improving and with the increased activities in plant construction a decided improvement in the demand for practically all lines of equipment is looked for. Equipment for municipal public works has had considerable to do with stimulating the demand for electrical lines and some very good orders have recently been received. Small tools are in good demand with users buying not only for immediate needs but also against future requirements. Prices continue strong.

The City Council, Edmonton, Alta., has authorized the expenditure of \$150,000 for power plant extensions and improvements.

The Canadian Wire Bound Boxes, Ltd., 17 Mill Street, Montreal, is in the market for a 40-hp. electric motor.

The St. Lawrence Balling Co., 23 St. Francois Xavier Street, Montreal, is in the market for one 1½-hp., one 3½-hp., and one 2-hp., electric motor.

The City Council, Sault Ste. Marie, Ont., is having plans prepared for the installation of two gasoline engines for direct connection to pumps in the pumping station, to cost \$20,000.

The London Bridge Co., London, Ont., will build a factory to cost \$50,000.

The Hochelaga Cement Co., 145 St. James Street, Montreal, is having plans prepared for the erection of a plant.

The Dexter Lock Co. of Canada, Ltd., has recently been formed to manufacture patent door locks, similar to those produced by the National Brass Co., Grand Rapids. It has secured the premises formerly occupied by the National Machinery & Supply Co., at Hamilton, Ont., and will commence operations as soon as equipment can be installed. O. W. Cook is president and manager.

William Marshall, Dunnville, Ont., will receive bids until

April 17, for the following equipment: A—one 1350 Imperial gal. per min. centrifugal pump with gasoline engine direct connected, 8 ft. to 15 ft. suction (average 10 ft.) and 250 ft. head; B—one 1350 Imperial gal. per min. centrifugal pump with electric motor direct connected pump; C—one 750 Imperial gal. per min. centrifugal pump with electric motor direct connected, 8 to 15 ft. suction, 100 ft. head; D—one 1350 Imperial gal. per min. centrifugal pump, with gasoline engine direct connected, 12 to 15 ft. suction and 15 ft. head, with electric motor direct connected in other end of same bed plate; E—one 750 Imperial gal. per min. centrifugal pump, with electric motor direct connected, 12 to 15 ft. suction and 15 ft. head; F—electric starter for A and D with one rectifier and storage battery, all necessary fittings, wiring, etc.

Louis Pelletier, St. Donat, will build a sawmill at Luceville, Que., estimated to cost \$40,000.

Central Steel Co.'s Report

The Central Steel Co., Massillon, Ohio, reported an operating loss of \$88,107 during 1921. During the year, two affiliated companies, the Massillon Rolling Mill Co. and the National Pressed Steel Co., were merged with this company and the annual report covers the three merged units. The steel producing division showed an operating profit of \$58,918 and the sheet mill division a loss of \$16,163. Combined sales for the year were \$11,203,859, or 32.9 per cent of those in 1920. The ingot production was 51 per cent of that of 1920. The condensed balance sheet shows the following:

Assets	
Total current assets	\$5,748,816
Other investments	96,364
Fixed assets (real estate, plant and equipment)	19,376,281
Deferred charges	683,886
Total	\$25,905,348

Liabilities and Capital	
Total current liabilities	\$1,016,374
Bonded debt	5,000,000
Reserves	4,045,267
Preferred stock issued	6,216,400
Common capital stock and surplus	9,627,307
Total	\$25,905,348

General Electric Report

The 1921 report of the General Electric Co. shows net sales of \$221,007,992, contrasted with \$275,758,487 in 1920. Deducting operating expenses and federal taxes an operating income of \$21,676,683, and after other income, interest, etc., \$21,652,812 available for dividends, equivalent to 12.6 per cent on the \$172,194,300 stock outstanding on Dec. 31, last. The amount available for dividends in 1920 was \$22,132,288, equal to 15.8 per cent on \$139,026,900 stock. At the close of 1921, the surplus account stood at \$70,126,921, as against \$70,048,610 at the end of 1920, and \$64,010,245 at the close of 1919.

At the close of the year the company had \$45,391,000 unfiled business on its books, whereas at the close of 1920 it had \$111,778,000. The company is occupying 25,042,000 sq. ft. floor space, contrasted with 22,733,000 sq. ft. at the close of 1920. During the year all outstanding notes were canceled, \$23,862,912 invested in government securities, and on Dec. 31, last, the company had \$39,888,683 cash.

Operations Increasing

Present directors of the Wheeling Mold & Foundry Co., Wheeling, W. Va., were re-elected at the annual meeting of the stockholders, March 30. They are: Herbert E. Field, B. W. Peterson, Robert Hazlett, George W. Field, Arnold G. Stifel, T. Coleman Ward, C. W. Hendrix, Henry M. Russell and Charles C. Woods. In his report to the stockholders, President Herbert E. Field said that commercial orders were increasing daily and were filling the gap created by the cancellation of Government orders. Sales of the company during 1921 had a value of \$3,979,377 and the net earnings were \$41,577. The full dividend of 7 per cent was paid on the preferred stock and one dividend of 50 cents a share was disbursed on the common stock. Plant operations, which at one time during the year dropped to 15 per cent, the lowest in the history of the company, now are back to 30 per cent of capacity, Mr. Field said. The plant of the Wheeling Steel Casting Co., acquired early in 1921, is being remodeled and will turn out chilled rolls.

Frazar & Co., exporters and importers, New York, announce that Leighton H. Peebles, formerly general manager, has been admitted to partnership. The firm will therefore hereafter consist of Everett W. Frazar, Glowacki R. Parker, Richard F. Warner and Leighton H. Peebles.

IRON AND INDUSTRIAL STOCKS

Advance in Prices Not Based on Investment Buying Alone

The volume of trading in iron and industrial securities on the stock exchanges during the past week strongly suggests that the advance in prices has ceased to be based on investment buying alone. The abundance of cheap money in the financial centers has invited speculation on a broad scale. But because of better general industrial conditions in the country at large, more particularly in the steel and allied industries, there remains a genuine investment demand for a large number of issues not listed on stock exchanges. This fact, coupled with the continued large investment demand for all classes of bonds, tends to lessen any apprehension that might result from the tremendous amount of pure speculation evident to-day. Since last reports many of the steel and equipment stocks have sold at new high prices for the year.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

Allis-Chalmers ..	46 1/2 - 48 1/2	Int. Har. pf.	110
Allis-Chalmers pf. 92 1/2 - 93 1/2		Lackawanna St.	50 1/2 - 54 1/2
Am. B. S. & Fdy. 58 - 62		Lima Loco.	110 - 111 1/2
Am. B. S. & F. pf. - 103		Midvale Steel ..	33 1/2 - 35 1/2
Am. Can. 47 1/2 - 49		Nat.-Acme	15 1/2 - 16 1/2
Am. Can. pf. 102 - 103 1/2		Nat. Enam. & St.	35 - 37 1/2
Am. Car & Fdy. 154 - 156		N. Y. Air Brake.	67 1/2 - 72
Am. C. & F. pf. - 118		Nova Scotia Steel 26 - 29 1/2	
Am. Loco. 110 - 113 1/2		Otis Steel	12 1/2 - 14 1/2
Am. Radiator ... 86 - 87 1/2		Otis Steel pf.	56 - 65
Am. Steel Faries 36 1/2 - 38 1/2		Pitts. Steel pf.	90
Am. St. Fd. pf. 96 1/2 - 96 1/2		Pressed Steel	73 1/2 - 77
Bald. Loco. 110 1/2 - 116 1/2		Pressed St. pf.	93 - 93 1/2
Bald. Loco. pf. 108 - 108 1/2		Ry. Steel Spring.	98 1/2 - 101
Beth. Steel 68 1/2 - 75		Ry. Steel Sp. pf.	113
Beth. Steel, Cl. B 73 1/2 - 78 1/2		Rephlogie Steel	30 1/2 - 36 1/2
Beth. St. 8% pf. - 112		Republic pf.	53 1/2 - 56 1/2
Brier Hill - 17		Sloss	41 1/2 - 45 1/2
Br. Em. S. 9 1/4 - 9 1/2		Sloss pf.	70 1/2 - 71
Br. Em. S. 1st pf. 65 - 70		Superior Steel	34 1/2 - 39 1/2
Br. Em. S. 2nd pf. 20 1/2 - 23		Steel of Can.	66 1/2 - 69 1/2
Cambria 73 1/2 - 78		Transue-Williams 41 - 45 1/2	
Chic. Pneu. Tool. 69 1/2 - 71		Un. Alloy Steel.	31 - 31 1/2
Colo. Fuel 30 - 32 1/2		U. S. Pipe.	35 1/2 - 38 1/2
Crucible Steel. 56 1/2 - 65		U. S. Pipe pf.	65 1/2 - 69 1/2
Crucible Steel pf. 84 1/2 - 88		U. S. Steel.	95 1/2 - 98 1/2
Deere & Co. - 71		U. S. Steel pf.	117 - 117 1/2
Dominion Steel. 23 1/2 - 25 1/4		Vanadium Steel.	39 - 45
Gen. Electric. 157 1/2 - 164		Va. I. C. & Coke.	45
Gt. No. Ore Cert. 36 1/2 - 40 1/2		West. Air Brake.	89 - 90
Gulf States Steel 71 - 84 1/2		West'house Elec.	57 - 62 1/2
Gulf S. St. 1st pf. - 95			
Inland Steel 50 - 51 1/2			
Int. Har. 95 1/2 - 98			

Industrial Finances

A special stockholders' meeting of the Sharon Steel Hoop Co., Sharon, Pa., has been called for June 7 to approve authorization of \$5,000,000 8 per cent preferred stock, of which \$1,500,000, carrying an equal amount of bonus common, is to be issued. The proceeds will be used as working capital and to pay obligations. New preferred will be \$50 par value, the same as present common, and will be offered pro-rata at par to shareholders. Any unsubscribed portion has been underwritten. The company has in its treasury the 80,000 shares of common required to go with the preferred as a bonus. Operations of the interest are approaching normal and it will blow in its Mary blast furnace at Lowellville, Ohio, this week.

Statement of Remington Typewriter Co., for the year ended Dec. 31, 1921, shows deficit of \$2,850,146, after charges, reduction of inventories and depreciation. This compares with surplus of \$1,578,459, equivalent, after preferred dividends, to \$8.14 a share, earned on the \$9,996,000 common stock in the previous year.

Canadian Westinghouse Co. Ltd., for the year ended Dec. 31, 1921, shows net earnings of \$1,091,379, after expenses, taxes and depreciation, equivalent to \$14.71 a share earned on the \$7,417,900 outstanding capital stock. This compares with net earnings of \$916,080, or \$12.33 a share in the previous year.

The financial statement for 1921 filed recently at the State House, Boston, by the Norton Co., Worcester, Mass., shows, after large adjustments in inventories and liberal amortization charges for war time facilities, a surplus of \$7,184,844. The company has no notes outstanding, and only \$85,273 in current liabilities, and a ratio of total current assets to current liabilities of about 76 to one, without counting investments in subsidiary plants as quick assets.

Directors of the Savage Corporation, Sharon, Pa., formerly the Savage Arms Corporation, have authorized a bond issue of \$3,000,000. Change of name is due to the fact that the company is moving away from the exclusive manufacture of arms and is to enter other fields of manufacture.

The Standard Screw Co. reports for the year ended Dec.

31, last, net income, after depreciation, taxes, etc., of \$125,614, compared with \$1,744,331 in 1920. The total surplus on Dec. 31, last, was \$6,712,918, compared with \$7,336,852 on Dec. 31, 1920.

The report of the J. G. White companies for the year ended Dec. 31, last, shows a deficit after preferred dividends of \$126,484, contrasted with a surplus of \$313,016 in 1920.

Business Improving

At the annual meeting held March 31 of the stockholders of the Empire Tube & Steel Corporation, College Point, N. Y., directors re-elected for ensuing year were John Fraser, C. J. Thompson, William F. Thurmond and L. J. Roine. Directors elected to fill vacancies were John Kearns, Carl M. Beattie and George W. Kinsey. C. J. Thompson, general manager, reports there was a drastic shrinkage in the volume of business for the year 1921, but that the buying of the company's products has been better the past month than for any similar period in a year. The financial condition of the company is excellent. No bank borrowings were necessary to carry on the business during the year 1921.

Rockford Machine-Tool Agencies

The Rockford Milling Machine Co., Rockford, Ill., has appointed the following new selling agents: Mid-West Machinery Exchange, Kansas City, Mo., to handle Sunstrand lathes in the Kansas City territory; English Tool & Supply Co., Kansas City, Mo., to handle Rockford milling machines in the same territory; Peden Iron & Steel Co., Houston, Tex., to handle Rockford milling machines in Texas; Greensboro Supply Co., Greensboro, N. C., to handle Rockford milling machines in North and South Carolina.

Plans of New Companies

The Graves Air Brake Coupler Co., Buffalo, recently incorporated to manufacture couplers and other railroad equipment, expects to build its own couplers, but is not ready as yet, as it has not built a plant. Some orders have been received, however, and the company is negotiating with Buffalo manufacturers to make couplers. The design has been indorsed by S. J. Heberling, president of the Switchmen's Union for 16 years, and officials of the Erie and New York Central railroads. The officers are as follows: President, Richard W. Boyle, Prudential Building, Buffalo; vice-president, Edward A. Graves, Jamestown, N. Y.; secretary-treasurer, John M. Hartman, Kenmore, N. Y., and Ernest C. Pless, Lockport, N. Y., and Stanley R. Ketcham, New York, are the other two directors.

The assets of the Coe-Stapley Mfg. Corp., West Haven, Conn., manufacturers of sheet metal goods and automobile appliances, have been sold to P. J. Holdsworth, New York, for \$27,000. The plant was shut down recently. The new owner plans to straighten out the financial affairs of the company immediately and open up the plant in the near future. The New England Tube & Stamping Co., Inc., has been incorporated under the laws of Connecticut to take over the plant and will make automobile accessories, metal tubes and machine parts. The capital stock is \$200,000, and the incorporators are Mr. Holdsworth, New York; J. M. Harding, 178 Lawrence Street, New Haven, Conn., and R. R. Adams of Bridgeport, Conn.

The firm of Wunsch & TerKuile, with offices and warehouse at 302-4 McDougal Street, Brooklyn, was recently organized. It is a co-partnership of J. W. Wunsch and C. V. TerKuile and will act as the selling agent for manufacturers of material-handling machinery and industrial and engineering equipment. The firm will act as exclusive selling agents for the Silent Hoist Co., and also represent several other manufacturers of contractors' equipment. Mr. Wunsch is a graduate mechanical engineer. He is the founder of the Silent Hoist Co., and will continue in an engineering advisory capacity with it. Mr. TerKuile is also a graduate engineer, and was formerly on the engineering staff of the E. I. DuPont de Nemours & Co., and the New York Ship Building Co.

The Boston branch, Chicago Pneumatic Tool Co., has moved from 182 to 172 High Street. F. V. Sargent is general manager.

Manning, Maxwell & Moore, Inc., has closed its offices in the Leader-News Building, Cleveland, and the Cleveland territory has been combined under the Pittsburgh district office. E. E. Winship, who has been district sales manager in Cleveland, remains in charge of the Cleveland territory under the Pittsburgh office.

The Whiting Corporation, Harvey, Ill., has removed its Chicago office from the Marquette Building to 945 Monadnock Block.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	Per Lb.
Refined iron bars, base price	2.38c.
Swedish bars, base price	10.00c.
Soft steel bars, base price	2.38c.
Hoops, base price	3.28c. to 3.38c.
Bands, base price	2.88c. to 2.98c.
Beams and channels, angles and tees 3 in. x 1/4 in. and larger, base	2.48c.
Channels, angles and tees under 3 in. x 1/4 in., base	2.38c.

Merchant Steel

Merchant Steel	Per Lb.
Tire, 1 1/2 x 1/2 in. and larger	2.40c.
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger)	2.60c.
Toe-calk, 1/2 x 3/8 in. and larger	3.20c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

1/4 in. and heavier	2.48c.
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Sheets

Blue Annealed	Per Lb.
No. 10	3.28c. to 3.35c.
No. 12	3.33c. to 3.58c.
No. 14	3.38c. to 3.63c.
No. 16	3.48c. to 3.73c.

Box Annealed—Black

Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	3.80c. to 4.05c.
Nos. 22 and 24	3.85c. to 4.10c.
No. 26	3.90c. to 4.15c.
No. 28	4.00c. to 4.25c.
No. 30	4.25c. to 4.50c.

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

Per Lb.
No. 14
No. 16
Nos. 18 and 20
Nos. 22 and 24
No. 26
No. 27
No. 28
No. 30

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Wrought Iron
Black Galv.	Black Galv.
1/2 in. Butt... 56 —40	3/4 in. Butt... 30 —13
3/4 in. Butt... 61 —47	1 1/2 in. Butt... 32 —15
1-3 in. Butt... 63 —49	2 in. Lap... 27 —10
3 1/2-6 in. Lap... 60 —46	2 1/2-6 in. Lap... 30 —15
7-8 in. Lap... 56 —34	7-12 in. Lap. —23 —7
9-12 in. Lap... 55 —33	

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE
High brass sheet
High brass wire
Brass rod
Brass tube, brazed
Brass tube, seamless
Copper tube, seamless

Copper Sheets

Sheet copper, hot rolled, 24 oz., 19 1/2c. to 20 1/2c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Coke—14-20	Primes Wasters
Grade "AAA"	80 lb. \$6.05	\$5.80
Charcoal	90 lb. 6.15	5.90
14x20	100 lb. 6.25	6.00
IC. \$10.00	8.50	6.40
IX. 11.50	10.00	7.40
IXX. 13.00	11.25	8.40
IXXX. 14.25	12.50	9.40
IXXXX. 16.00	14.00	10.40

Terne Plates

8-lb. coating 14 x 20	
100 lb.	\$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33c.
Bar	40c. to 44c.

Copper

Lake ingot	15 c.
Electrolytic	14 1/4c.
Casting	14 1/2c.

Spelter and Sheet Zinc

Western spelter	6 1/2c. to 7c.
Sheet zinc, No. 9 base, casks	.9 1/2c. open 10c.

Lead and Solder*

American pig lead	6 c. to 6 1/2c.
Bar lead	6 1/2c. to 7 c.
Solder, 1/2 and 1/2 guaranteed	.23c.
No. 1 solder	.21c.
Refined solder	.17c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	.75c.
Commercial grade, per lb.	.35c.
Grade D, per lb.	.25c.

Antimony

Asiatic	5 1/4c. to 6c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. .25c. to .27c.

Old Metals

The market is firm with an upward tendency. Dealers' buying prices are nominally as follows:

Cents
Per Lb.

Copper, heavy crucible	10.75
Copper, heavy wire	9.75
Copper, light and bottoms	8.00
Brass, heavy	5.00
Brass, light	4.50
Heavy machine composition	7.75
No. 1 yellow brass turnings	5.25
No. 1 red brass or composition turnings	6.75
Lead, heavy	3.75
Lead, tea	2.50
Zinc	2.50